Arlington Conservation Commission

Date: Thursday, March 3, 2022
Time: 7:30 AM
Location: Conducted by Remote Participation

Pursuant to State Legislation suspending certain provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the March 3, 2022, public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom. Please register in advance for this meeting. Reference materials, instructions, and access information for this specific meeting will be available 48 hours prior to the meeting on the Commission's agenda and minutes page. Registration: https://town-arlington-ma-us.zoom.us/meeting/register/tZEqcuyvqjgpHdd98ZwruZj_z3SR6m7Yu6vi

Agenda

1. Administrative
    a. Approval of Meeting Minutes from February 3, 2022
    b. Approval of Environmental Monitor for 1165R Development
    Bohler Engineering has been chosen as the Environmental Monitor for the project at 1165R Massachusetts Avenue, pending Conservation Commission approval.
    c. Proposal to change scheduled meeting time to 7 PM start time
    Chair Susan Chapnick will present a proposal to move the start time of Conservation Commission meetings to 7 PM.
2. Discussion
    a. Minor Amendment of Arlington Reservoir Phase II Permit (DEP #091-0327)
    Proposed changes to the approved permit include improvements to the connection from the Reservoir perimeter trail to the entrance of Hurd Field.
3. Hearings

Notice of Intent: 34 Dudley Street

This public hearing will consider a Notice of Intent to construct a five-story self-storage facility at 34 Dudley Street and remove a failing retaining wall on the adjacent Town-owned parcel at 0 Grove Street. As proposed, the project will result in impacts within the Riverfront Area to Mill Brook, 100-foot Adjacent Upland Resource Area, and buffer zone to Bank.

Request for Determination of Applicability: 99 Sunnyside Avenue

This public hearing will consider a Request for Determination of Applicability for renovations to the private residence located at 99 Sunnyside Avenue. Work is proposed to be conducted within the 200-Foot Riverfront Area and 100-foot Buffer Zone to Alewife Brook as well as Bordering Land Subject to

Flooding (FEMA Zone AE). Renovation includes new framing, siding, roofing, and interior renovation, as well as replacement of an existing impervious private walkway.

Notice of Intent: Colonial Village Drive (Continuation)

This public hearing will consider a Notice of Intent to reconstruct all on-site parking and access driveways and curbing, as well as installation of stormwater management systems and conduct site grading at Colonial Village Drive. All work is proposed to be conducted within the 100-foot Buffer Zone to the Inland Bank of a perennial stream that flows from the Arlington Reservoir, the 200-foot Riverfront Area associated with Mill Brook, and Bordering Land Subject to Flooding (FEMA Zone AE).

Notice of Intent: Hurd Field (Continuation)

This public hearing will consider a Notice of Intent for renovations to Hurd Field located at 0 Massachusetts Avenue and 0 Lowell Street (off Drake Road). Work is proposed to be conducted within the Riverfront Area to Mill Brook, Bordering Land Subject to Flooding (FEMA Zones AE and X, Floodway), the 100-foot Buffer Zone to Bordering Vegetated Wetlands and the Adjacent Upland Resource Areas. Renovation includes regrading and reorienting the athletic fields, upgrading field lighting, and constructing a pedestrian loop path, irrigation system, and other new amenities.

Notice of Intent: Spy Pond Playground (Continuation)

This public hearing will consider a Notice of Intent for improvements to Spy Pond Playground and the ramp to Spy Pond at North Beach, both located at 0 Pond Lane. Work is proposed to be conducted within the Adjacent Upland Resource Area and 100-foot buffer zone to Inland Bank and Bordering Vegetated Wetland. The improvements include replacing play equipment, replacing safety surfacing, replacing perimeter fence, and the addition of a new playground entrance. The scope also includes replacing the pathway material used at North Beach ramp.

Town of Arlington, Massachusetts

Approval of Environmental Monitor for 1165R Development

Summary:
Approval of Environmental Monitor for 1165R Development
Bohler Engineering has been chosen as the Environmental Monitor for the project at 1165R Massachusetts Avenue, pending Conservation Commission approval.

ATTACHMENTS:

Type	File Name	Description
Reference Material	Letter_from_Paul_Boutchia_of_JLL_Concerning_Environmental_Monitor_for_1165R_Mass_Ave.pdf	Letter from Paul Boutchia of JLL Concerning Environmental Monitor for 1165R Mass Ave

February 17, 2022

Mr. David Morgan
Environmental Planner/Conservation Agent
Town of Arlington
Conservation Commission
730 Massachusetts Ave, Arlington, MA 02476

RE: 1165R Massachusetts Avenue Redevelopment – Environmental Monitor

Dear Mr. Morgan:
This letter is written pursuant to Paragraph 49, under the heading *Additional Special Conditions,* from the Order of Conditions for the above referenced project (enclosed for reference).

The Proponent of the development requests that the Town of Arlington Conservation Commission accept Bohler Engineering, Civil Engineer of Record, to fulfill the role of Environmental Monitor.

Bohler Engineering has forty-year history of providing Site/Civil Engineering services and has been involved in this project from its outset, providing design services and guidance into all site-related matters.

Enclosed is the resume of Bohler's Project Manager, Randy Miron, who acts as the main point of contact for the Bohler team. He, in conjunction with others from Bohler, will be responsible for the periodic reporting required by the Order of Conditions.

We trust that Bohler Engineering satisfies the requirements of Environmental Monitor.

Please feel free to contact me should you have any questions.

Sincerely,

Paul Boutchia, VP JLL

Encl.
Randy Miron Resume

PROJECT TEAM



RMIRON@BOHLERENG.COM

Randy Miron

Project Manager - Civil Engineering

As a Project Manager for Bohler's Southborough office, Randy oversees civil engineering design projects throughout the New England region. With more than 17 years of experience, Randy has worked on a variety of projects including municipal, commercial and residental sites.

From concept through to construction, Randy is involved in all phases of land development. He leads a team of design engineers through site investigation and due diligence, preparation of concept drawings, grading, utility and stormwater management design. He is responsible for managing the subconsultant team, agency reviewer coordination, and daily client interaction.

EDUCATION

B.S. Civil Engineering
University of Massachusetts Lowell

PROFESSIONAL LICENSES

MA Licensed Soil Evaluator

MA Licensed Title 5 System Inspector

PROFESSIONAL AFFILIATIONS

American Society of Civil Engineers (ASCE)

BOHLER, SOUTHBOROUGH, MA (15 YEARS)

UMass Memorial Hospital Marlborough - Women's Imaging Center, Marlborough, MA: Randy is managing the design for this single-story, 4,000 SF medical office building. As part of the overall hospital campus, the project required significant coordination with various hospital departments to ensure a cohesive design.

Reliant Medical Group, Worcester, MA: Randy provided site civil and consulting engineering, permitting and program management services for multiple 40,000 SF - 80,000 SF medical office facilities. Randy helped to develop "Basis of Design" standards for the new locations, including site layout, drop-off areas, and exterior amenities for patients and staff. Bohler pursued aggressive schedules, enabling client transition into new spaces without interruption to patient care.

Fresenius Kidney Care Dialysis Centers, Two Locations in MA: Randy provided engineering design, permitting and landscape architecture services for 8,000 SF - 12,500 SF dialysis centers within existing shopping centers.

SCHOFIELD BROTHERS OF NEW ENGLAND (4 YEARS)

Project Engineer

Proposal to change scheduled meeting time to 7 PM start time

Summary:
Proposal to change scheduled meeting time to 7 PM start time
Chair Susan Chapnick will present a proposal to move the start time of Conservation Commission meetings to 7 PM.

Town of Arlington, Massachusetts

Minor Amendment of Arlington Reservoir Phase II Permit (DEP #091-0327)

Summary:
Minor Amendment of Arlington Reservoir Phase II Permit (DEP #091-0327)
Proposed changes to the approved permit include improvements to the connection from the Reservoir perimeter trail to the entrance of Hurd Field.

ATTACHMENTS:

	Type	File Name	Description
🗋	Reference Material	Minor_Amendment_of_Arlington_Reservoir_Phase_II_Permit_Package.pdf	Minor Amendment of Arlington Reservoir Phase II Permit Package

Subject: Arlington Reservoir - Hurd Field Connection
From: Danielle Desilets <ddd@kylezick.com>
Date: 2/14/2022, 10:38 AM
To: David Morgan <dmorgan@town.arlington.ma.us>
CC: "Joe Connelly (jconnelly@town.arlington.ma.us)" <jconnelly@town.arlington.ma.us>, "Leslie Mayer (blmayer@msn.com)" <blmayer@msn.com>, Mickey Marcus <mmarcus@swca.com>, Kyle Zick <kzick@kylezick.com>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.

Good morning, David –

We had previously discussed a potential amendment to the on-going work at the Reservoir. Attached you will find a plan (SKL-9) of the proposed changes which create a connection from the Reservoir perimeter loop trail to the entrance of Hurd Field. The proposed work includes the following:

- adding some additional timber crib steps between the existing ADA walkway switchback,
- cleaning debris from the bridge surface,
- milling & overlaying the existing bituminous pavement surface on the bridge,
- adding handrails to the bridge per Building Code,
- formalizing the existing walkway on either side of the bridge with an impervious surface (see SKL-10, the product is Porous pave – this is the same material used on the walkway at Spy Pond), and
- clearing some invasives & scrub brush on the edges of the trail.

We are hoping that this work will fall under an amendment or minor change to the existing NOI/Order of Conditions for the Reservoir work.

I'd be happy to discuss the proposed work with you further if you have any questions.

Thank you very much,
Danielle

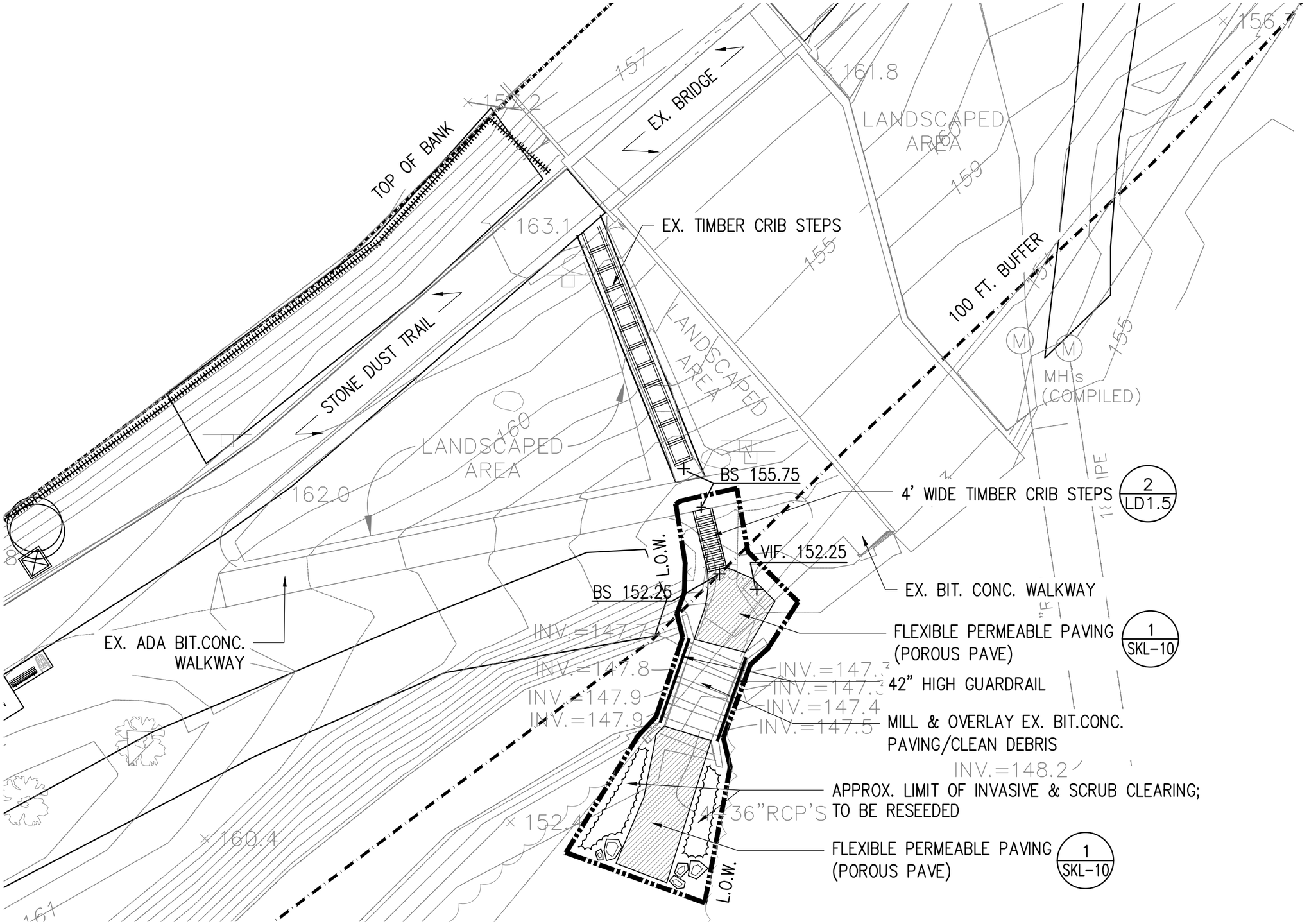
kzla

Danielle D. Desilets, RLA
Senior Associate
(she/her)

Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202, Boston, MA 02108
t: 617-451-1018. m: 508-364-1403
e: ddd@kylezick.com www.kylezick.com @kzlaboston

Attachments:

AR_SKL-9.pdf	359 KB
AR_SKL-10.pdf	104 KB



1 CONNECTION TO HURD FIELD

SCALE: 1"=20'-0"

kzla

SKL-9

CONNECTION TO HURD FIELD

FORMER SHEET L-2.3

SCALE AS NOTED

ARLINGTON RESERVOIR

Arlington, MA

09/16/2021

SECTION

1 FLEXIBLE POROUS PAVING

SCALE: 1-1/2"=1'-0"

kzla

SKL-10

FLEXIBLE POROUS PAVING

SCALE AS NOTED

ARLINGTON RESERVOIR

Arlington, MA

02/10/2022

Town of Arlington, Massachusetts

Notice of Intent: 34 Dudley Street

Summary:
This public hearing will consider a Notice of Intent to construct a five-story self-storage facility at 34 Dudley Street and remove a failing retaining wall on the adjacent Town-owned parcel at 0 Grove Street. As proposed, the project will result in impacts within the Riverfront Area to Mill Brook, 100-foot Adjacent Upland Resource Area, and buffer zone to Bank.

ATTACHMENTS:

	Type	File Name	Description
🗋	Reference Material	34_Dudley_Notice_of_Intent_Package.pdf	34 Dudley Notice of Intent Package

Proposed Self-Storage Facility

34 Dudley Street
Arlington, Massachusetts

PREPARED FOR

PSI Atlantic Arlington MA, LLC
530 Oak Court Drive
Suite 155
Memphis, TN 38177
858-229-0102

PREPARED BY

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

February 2022

Table of Contents

Notice of Intent Forms

- WPA Form 3
- Fee Transmittal Form
- Copy of Filing Fee Checks
- Legal Notice Charge Form

Notice of Intent Figures

- Figure 1 – USGS Map
- Figure 2 – Aerial Map
- Figure 3 – NHESP Map
- Figure 4 – FEMA Map

Attachment A - Notice of Intent Narrative

Introduction 1
Site Description 2
Wetland Resource Areas 3
Work Description 4
Mitigation Measures 6
Regulatory Compliance 9
Summary 12

Attachment B – Abutter Notification

Attachment C – Photographic Log

Attachment D – Stormwater Report

Attachment E – Project Plans

February 17, 2022

Ref: 52816.00

Susan Chapnick, Chair
Arlington Conservation Commission
730 Mass Ave. Annex
Arlington, MA 02476

Re: Self-Storage Facility Construction
Notice of Intent

Dear Chairperson Chapnick,

On behalf of the Applicant, PSI Atlantic Arlington MA LLC, Vanasse Hangen Brustlin, Inc. is submitting the enclosed Notice of Intent (NOI) for redevelopment of the property located at 34 Dudley Street (the Project Site) to construct a five-story self-storage facility and remove a failing retaining wall on the adjacent Town-owned parcel (the Project) in Arlington, MA. Proposed work generally consists of removing the existing building and garage, installation of the stormwater system and associated drainage features, construction of the new storage facility, repaving of the lot, and revegetation within the Project Site. Proposed work also includes removing the existing retaining wall and regrading and stabilizing the slope on the Town-owned parcel. A full scope of work is included in the attached NOI narrative. This NOI is being filed pursuant to the Massachusetts Wetlands Protection Act (WPA) and the Town of Arlington's Wetlands Protection Bylaw (the Bylaw).

Portions of land on or near the Project Site contain resource areas subject to the jurisdiction of the WPA and the Bylaw, including Bank and Riverfront Area (RA). The Bylaw also establishes a 100-foot Adjacent Upland Resource Area (AURA), with specific limitations within 25 feet and 50 feet of resource areas. Additionally, the WPA and the Bylaw establish a 100-foot buffer zone to Bank. All resource areas are associated with Mill Brook. As proposed, the Project will result in impacts within the RA, 100-foot AURA, and buffer zone to Bank. As a result of the proposed work, there will also be a 4,240 sf reduction in impervious surface within RA on the Project Site.

Checks made payable to the Town of Arlington in the amounts of $803.34 for the Bylaw fee and $800.00 for the Town Share of the NOI filing fee have been included with this submission. Additionally,

101 Walnut Street
PO Box 9151
Watertown, Massachusetts 02471
P 617.924.1770
F 617.924.2286

Engineers | Scientists | Planners | Designers

a check made payable to the Commonwealth of Massachusetts in the amount of $775.00 has been submitted to the MassDEP lockbox for payment of the State share of the NOI filing fee.

In compliance with the WPA and the Arlington Conservation Commission filing guidelines, notification to abutters within 100 feet of the Project Site has been made by certified, return-receipt mail. A copy of the abutter notification form and a certified list of abutters are enclosed as part of the NOI.

Should you have any questions concerning this submittal, or require additional information please contact me at 617-607-6310.

Sincerely,

Taylor Donovan

Taylor Donovan
Environmental Scientist

Attachment: Notice of Intent – Arlington Self-Storage Facility

CC: DEP Northeastern Regional Office (filed electronically via eDEP)
PSI Atlantic Arlington MA LLC

Notice of Intent Forms

- WPA Form 3
- Fee Transmittal Form
- Copies of Filing Fee Checks
- Legal Notice Charge Form

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1342693
City/Town:ARLINGTON

A.General Information

1. Project Location:

a. Street Address	34 DUDLEY ST		
b. City/Town	ARLINGTON	c. Zip Code	02476
d. Latitude	42.42053N	e. Longitude	71.16613W
f. Map/Plat #	55	g.Parcel/Lot #	2-39.B

2. Applicant:

☐ Individual ☑ Organization

a. First Name	JESSE		b.Last Name	MORGAN	
c. Organization	PSI ATLANTIC ARLINGTON MA, LLC				
d. Mailing Address	530 OAK COURT DRIVE				
e. City/Town	MEMPHIS	f. State	TN	g. Zip Code	38177
h. Phone Number	858-229-0102	i. Fax		j. Email	jesse@pssinvestors.com

3.Property Owner:

☑ more than one owner

a. First Name	ANA		b. Last Name	OSARIO	
c. Organization	34 DUDLEY STREET LLC				
d. Mailing Address	34 DUDLEY STREET				
e. City/Town	ARLINGTON	f.State	MA	g. Zip Code	02476
h. Phone Number	617-731-9994	i. Fax		j.Email	ana@hynesauto.com

4.Representative:

a. First Name	TAYLOR		b. Last Name	DONOVAN	
c. Organization	VHB				
d. Mailing Address	101 WALNUT STREET, PO BOX 9151				
e. City/Town	WATERTOWN	f. State	MA	g. Zip Code	02471
h.Phone Number	617-607-6310	i.Fax		j.Email	tdonovan@vhb.com

5.Total WPA Fee Paid (Automatically inserted from NOI Wetland Fee Transmittal Form):

a.Total Fee Paid	1,575.00	b.State Fee Paid	775.00	c.City/Town Fee Paid	800.00

6.General Project Description:

REDEVELOPMENT FOR A SELF-STORAGE FACILITY AND REMOVAL OF A FAILING RETAINING WALL IN ARLINGTON, MA. SEE ATTACHED PROJECT NARRATIVE FOR FULL SCOPE OF WORK.

7a.Project Type:

1.☐ Single Family Home	2. ☐ Residential Subdivision
3.☐ Limited Project Driveway Crossing	4. ☑ Commercial/Industrial
5.☐ Dock/Pier	6. ☐ Utilities
7.☐ Coastal Engineering Structure	8. ☐ Agriculture (eg., cranberries, forestry)
9.☐ Transportation	10. ☐ Other

7b.Is any portion of the proposed activity eligible to be treated as a limited project subject to 310 CMR 10.24 (coastal) or 310

CMR 10.53 (inland)?

1. ☐ Yes ☑ No If yes, describe which limited project applies to this project:
2. Limited Project

8.Property recorded at the Registry of Deeds for:

a.County:	b.Certificate:	c.Book:	d.Page:
SOUTHERN MIDDLESEX		1502	40
SOUTHERN ESSEX		5718	57

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1.Buffer Zone & Resource Area Impacts (temporary & permanent):

☐ This is a Buffer Zone only project - Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.

2.Inland Resource Areas: (See 310 CMR 10.54 - 10.58, if not applicable, go to Section B.3. Coastal Resource Areas)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a.☐ Bank	1. linear feet	2. linear feet
b.☐ Bordering Vegetated Wetland	1. square feet	2. square feet
c.☐ Land under Waterbodies and Waterways	1. Square feet	2. square feet
	3. cubic yards dredged	
d.☐ Bordering Land Subject to Flooding	1. square feet	2. square feet
	3. cubic feet of flood storage lost	4. cubic feet replaced
e.☐ Isolated Land Subject to Flooding	1. square feet	
	2. cubic feet of flood storage lost	3. cubic feet replaced
f.☑ Riverfront Area	Mill Brook 1. Name of Waterway (if any)	
2. Width of Riverfront Area (check one)	☐ 25 ft. - Designated Densely Developed Areas only ☐ 100 ft. - New agricultural projects only ☑ 200 ft. - All other projects	
3. Total area of Riverfront Area on the site of the proposed project		31010 square feet

4. Proposed Alteration of the Riverfront Area:

32717	16688	16030
a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft.

and 200 ft.

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☑ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☑ Yes ☐ No

3.Coastal Resource Areas: (See 310 CMR 10.25 - 10.35)

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under	Land under the ocean below,
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beaches	Indicate size under Coastal Beaches and/or Coatstal Dunes, below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab, crea.
i. ☐ Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, Inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4.Restoration/Enhancement

☐ Restoration/Replacement

If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please entered the additional amount here.

a. square feet of BVW b. square feet of Salt Marsh

5.Projects Involves Stream Crossings

☐ Project Involves Streams Crossings

If the project involves Stream Crossings, please enter the number of new stream crossings/number of replacement stream crossings.

a. number of new stream crossings

b. number of replacement stream crossings

C. Other Applicable Standards and Requirements

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage of Endangered Species program (NHESP)?

a. ☐ Yes ☑ No

If yes, include proof of mailing or hand delivery of NOI to:
Natural Heritage and Endangered Species
Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

b. Date of map:FROM MAP VIEWER

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18)....

c. Submit Supplemental Information for Endangered Species Review * (Check boxes as they apply)

1.☐ Percentage/acreage of property to be altered:

(a) within Wetland Resource Area — percentage/acreage

(b) outside Resource Area — percentage/acreage

2.☐ Assessor's Map or right-of-way plan of site

3.☐ Project plans for entire project site, including wetland resource areas and areas outside of wetland jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

a.☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

b.☐ Photographs representative of the site

c.☐ MESA filing fee (fee information available at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/mass-endangered-species-act-mesa/mesa-fee-schedule.html)
Make check payable to "Natural Heritage & Endangered Species Fund" and **mail to NHESP** at above address

*Projects altering **10 or more acres** of land, also submit:*

d.☐ Vegetation cover type map of site

e.☐ Project plans showing Priority & Estimated Habitat boundaries

d. OR Check One of the following

1.☐ Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/eea/agencies/dfg/dfw/laws-regulations/cmr/321-cmr-1000-massachusetts-endangered-species-act.html#10.14; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2.☐ Separate MESA review ongoing.

a. NHESP Tracking Number

b. Date submitted to NHESP

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review...

2. For coastal projects only, is any portion of the proposed project located below the mean high waterline or in a fish run?
a. ☑ Not applicable - project is in inland resource area only
b. ☐ Yes ☐ No

If yes, include proof of mailing or hand delivery of NOI to either:

South Shore - Cohasset to Rhode Island, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 S. Rodney French Blvd
New Bedford, MA 02744

North Shore - Hull to New Hampshire:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930

If yes, it may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional office.

3. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

a. ☐ Yes ☑ No

If yes, provide name of ACEC (see instructions to WPA Form 3 or DEP Website for ACEC locations). **Note:** electronic filers click on Website.

b. ACEC Name

4. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☑ No

5. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L.c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L.c. 130, § 105)?
a. ☐ Yes ☑ No

6. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☑ Yes, Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol.2, Chapter 3)
2. ☑ A portion of the site constitutes redevelopment
3. ☑ Proprietary BMPs are included in the Stormwater Management System

b. ☐ No, Explain why the project is exempt:

1. ☐ Single Family Home

2. ☐ Emergency Road Repair

3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department by regular mail delivery.

1. USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the ☑ Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland ☑ [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.
3. Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s). ☐ Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.
4. List the titles and dates for all plans and other materials submitted with this NOI. ☑

a. Plan Title:	b. Plan Prepared By:	c. Plan Signed/Stamped By:	c. Revised Final Date:	e. Scale:
PROPOSED SELF STORAGE FACILITY	VHB	ERIC GERADE	February 9, 2022	1" = 20'

5. If there is more than one property owner, please attach a list of these property owners not listed on this form. ☑
6. Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed. ☐
7. Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed. ☐
8. Attach NOI Wetland Fee Transmittal Form. ☑
9. Attach Stormwater Report, if needed. ☑

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Intent
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1342693
City/Town:ARLINGTON

E. Fees

Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

370537
2. Mass. and Check Number

2/9/2022
3. Check date

370358
4. State Check Number

2/2/2022
5. Check date

Vanasse Hangen Brustlin, Inc.
6. Payor name on check: First Name

7. Payor name on check: Last Name

F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

1. Signature of Applicant

2/10/2022
2. Date

3. Signature of Property Owner (if different)

2/10/2022
4. Date

Taylor Donovan
5. Signature of Representative (if any)

2/15/2022
6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a copy of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

If the applicant has checked the "yes" box in Section C, Items 1-3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
WPA Form 3 - Notice of Wetland FeeTransmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:
MassDEP File #:
eDEP Transaction #:1342693
City/Town:ARLINGTON

A. Applicant Information

1. Applicant:

a. First Name	JESSE	b.Last Name	MORGAN		
c. Organization	PSI ATLANTIC ARLINGTON MA, LLC				
d. Mailing Address	530 OAK COURT DRIVE				
e. City/Town	MEMPHIS	f. State	TN	g. Zip Code	38177
h. Phone Number	8582290102	i. Fax		j. Email	jesse@pssinvestors.com

2.Property Owner:(if different)

a. First Name	ANA	b. Last Name	OSARIO		
c. Organization	34 DUDLEY STREET LLC				
d. Mailing Address	34 DUDLEY STREET				
e. City/Town	ARLINGTON	f.State	MA	g. Zip Code	02476
h. Phone Number	6177319994	i. Fax		j.Email	ana@hynesauto.com

3. Project Location:

a. Street Address	34 DUDLEY ST	b. City/Town	ARLINGTON

Are you exempted from Fee? ☐ (YOU HAVE SELECTED 'NO')

Note: Fee will be exempted if you are one of the following:

- City/Town/County/District
- Municipal Housing Authority
- Indian Tribe Housing Authority
- MBTA

State agencies are only exempt if the fee is less than $100

B. Fees

Activity Type	Activity Number	Activity Fee	RF Multiplier	Sub Total
B.) EACH BUILDING (FOR DEVELOPMENT) INCLUDING SITE;	1	1050.00	RFA MULTIPLIER 1.5	1575.00

City/Town share of filling fee	State share of filing fee	Total Project Fee
$800.00	$775.00	$1,575.00

Legal Notice Charge Authorization

DATE: 2/17/2022

TO: legals@wickedlocal.com

I hereby authorize Community Newspapers to bill me directly for the legal notice to be published in the Arlington Advocate newspaper on 2/24/2022 for a public hearing with the Arlington Conservation Commission to review a project at the following location:
34 Dudley Street.

Thank you.

Signed: Taylor Donovan

Send bill to:
101 Walnut Street (Address)
PO Box 9151
Watertown, MA 02471
617-607-6310 (Phone)

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

CITIZENS BANK
MASSACHUSETTS
5-7017/2110

370537
CHECK DATE

February 9, 2022

Eight Hundred and 00/100

AMOUNT

$800.00

Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02476

AUTHORIZED SIGNATURE

Security Check features Details on back

⑈370537⑈ ⑆211070175⑆ 113016371⑈

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

EMI Y BUSINESS FORMS 800.392.6018 VISION

370537

Check Date: 2/9/2022

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
Lisa Cummings Feb1	2/1/2022	1423131	$800.00			$800.00
Town of Arlington		TOTAL	**$800.00**			**$800.00**
Citizens	**89**	**0007194**				

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

CITIZENS BANK
MASSACHUSETTS
5-7017/2110

370358
CHECK DATE

February 2, 2022

Seven Hundred Seventy Five and 00/100

AMOUNT

$775.00

Commonwealth of Massachusetts
DEP-Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

⑈370358⑈ ⑆211070175⑆ ⑈3016137⑈

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

370358

Check Date: 2/2/2022

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
Lisa Cummins 2/1/22	2/1/2022	1423129	$775.00			$775.00
Commonwealth of Massachusetts		TOTAL	$775.00			$775.00
Citizens	41	0004919				

370560

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

CITIZENS BANK
MASSACHUSETTS
5-7017/2110

CHECK DATE

February 9, 2022

Eight Hundred Three and 34/100

AMOUNT

$803.34

Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02476

AUTHORIZED SIGNATURE

⑈370560⑈ ⑆211070175⑆ ⑈3016137⑈

VANASSE HANGEN BRUSTLIN, INC.
101 WALNUT STREET • PO BOX 9151
WATERTOWN, MASSACHUSETTS 02471

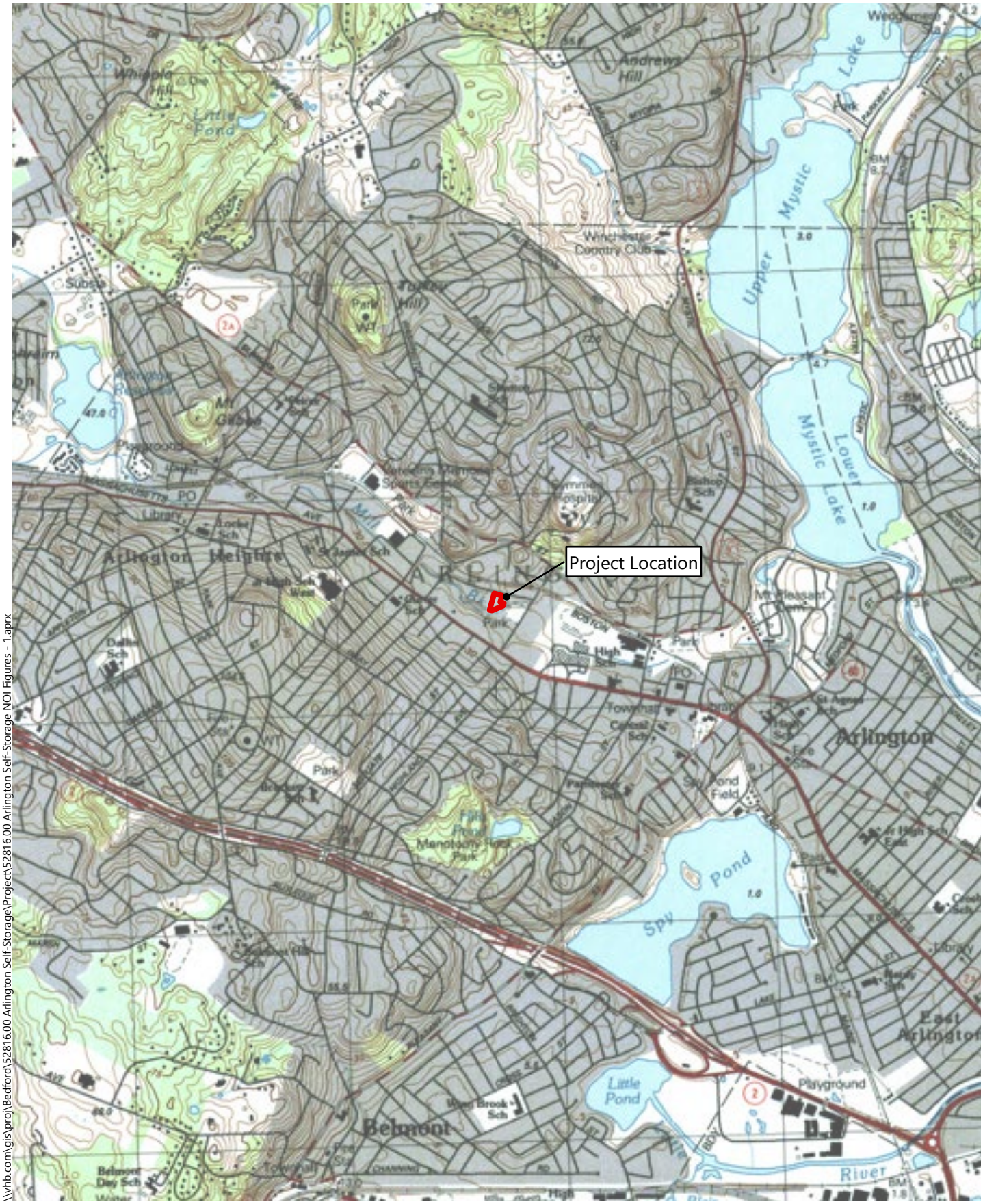
370560

Check Date: 2/9/2022

Invoice Number	Date	Voucher	Amount	Discounts	Previous Pay	Net Amount
Taylor Donovan 2/9	2/9/2022	1423469	$803.34			$803.34
Town of Arlington		TOTAL	$803.34			$803.34
Citizens	3	0007194				

Notice of Intent Figures

- Figure 1 – USGS Map
- Figure 2 – Aerial Map
- Figure 3 – NHESP Map
- Figure 4 – FEMA Map



\\vhb.com\gis\proj\Bedford\52816.00 Arlington Self-Storage\Project\52816.00 Arlington Self-Storage NOI Figures - 1.aprx

0 1000 2000 4000 Feet

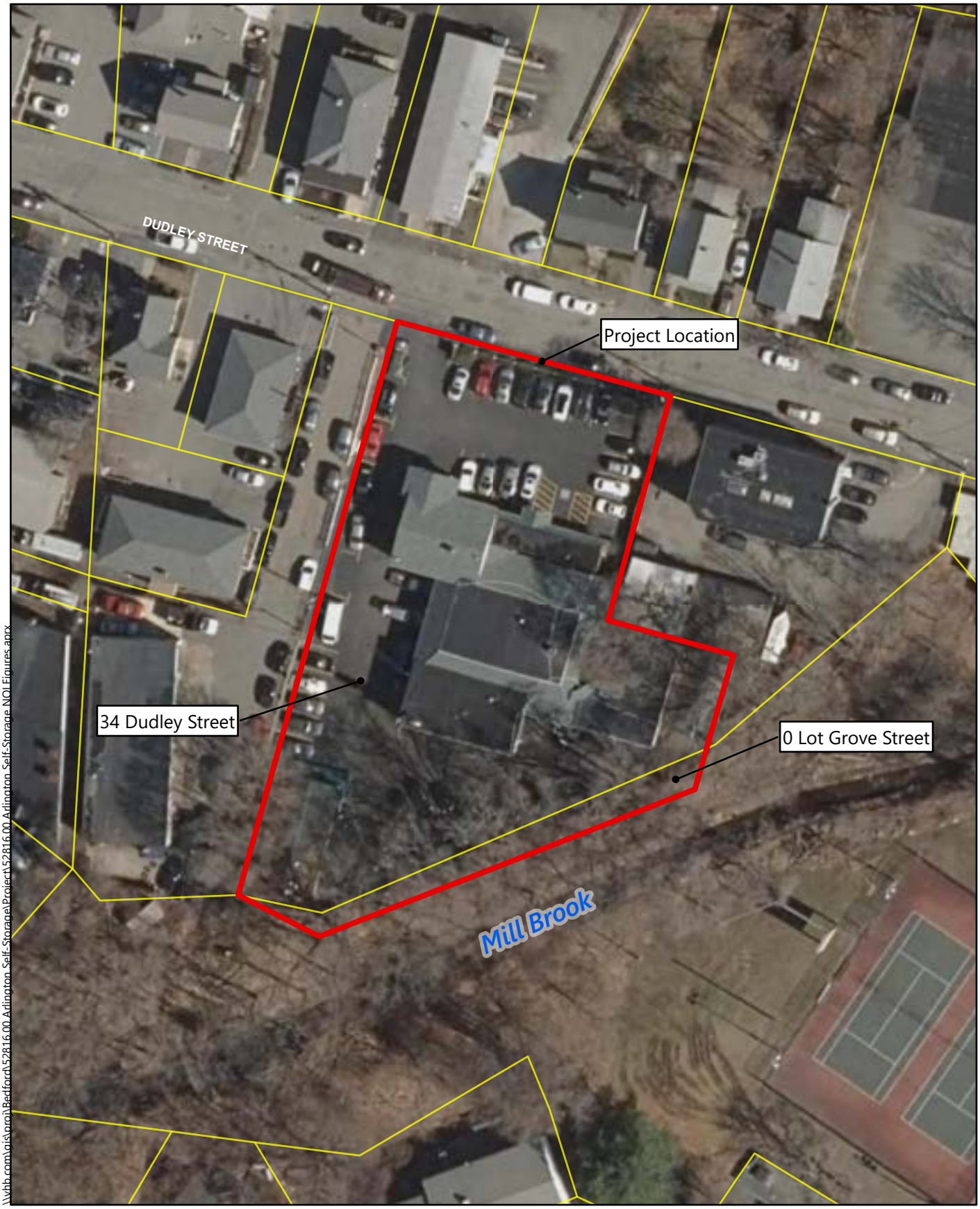
Arlington Self-Storage Facility | Arlington, MA

Legend

Project Area

Figure 1 - USGS Locus Map

Source Info: USGS, MassGIS, VHB



\\vhb.com\gis\proj\Bedford\52816.00 Arlington Self-Storage\Project\52816.00 Arlington Self-Storage NOI Figures.aprx

0 100 200 Feet

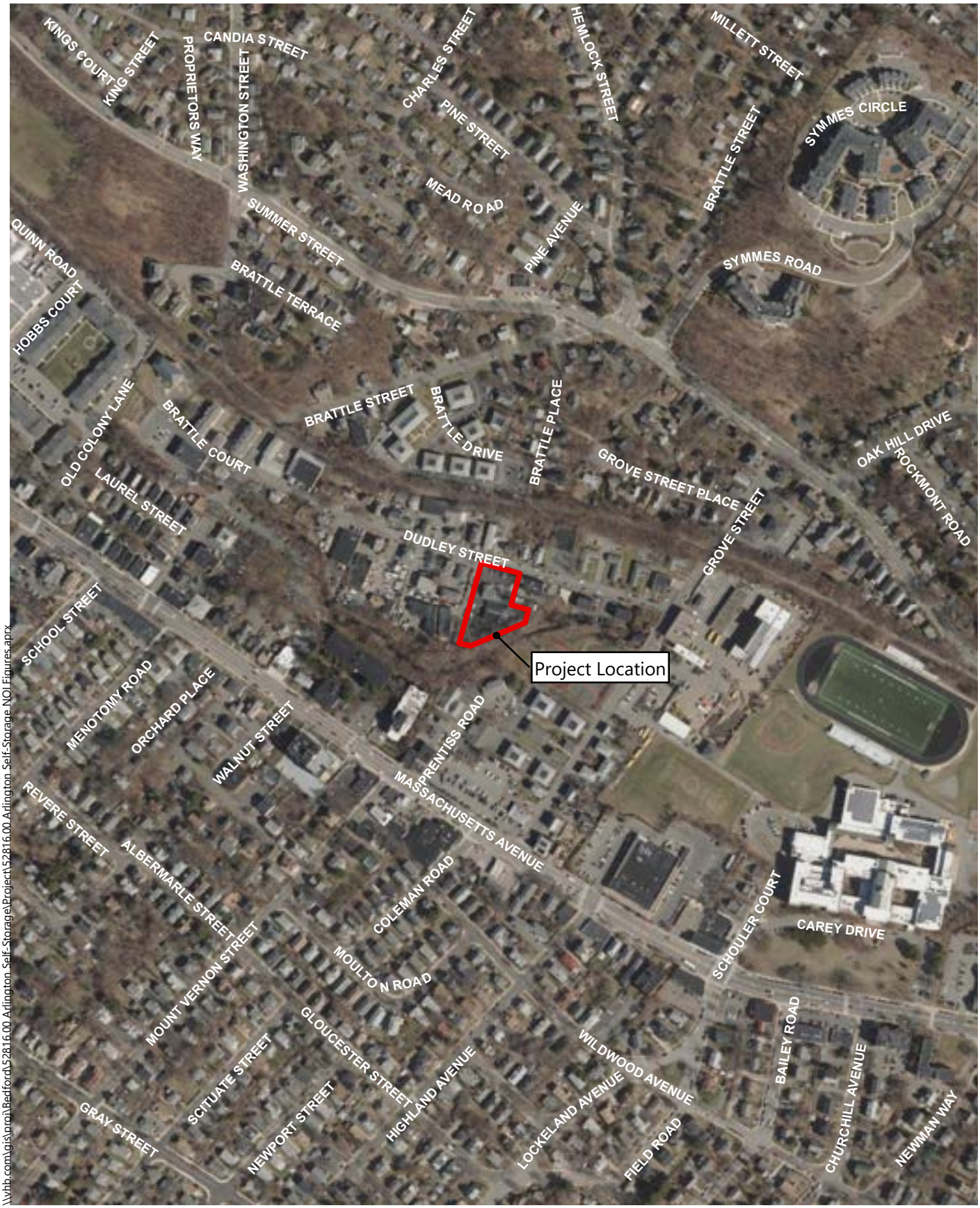
Arlington Self-Storage Facility | Arlington, MA

Legend

Project Area | Tax Parcels

Figure 2 - Aerial Map

Source Info: USGS, MassGIS, VHB

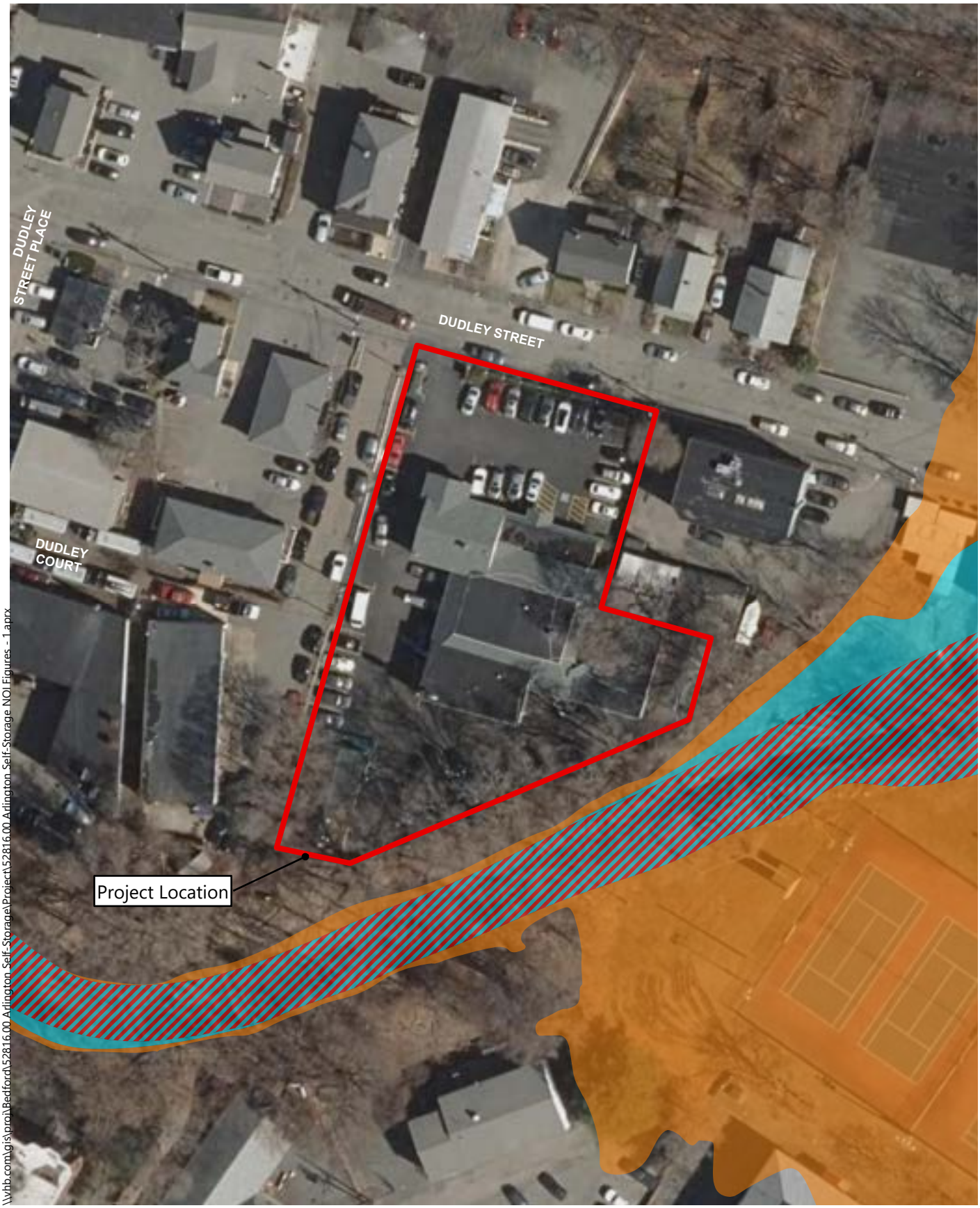


Arlington Self-Storage Facility | Arlington, MA

Legend

- Project Area
- NHESP Priority Habitats of Rare Species - None Present
- NHESP Estimated Habitats of Rare Wildlife - None Present
- NHESP Certified Vernal Pools - None Present
- NHESP Potential Vernal Pools - None Present

Figure 3 - NHESP Map
Source Info: USGS, MassGIS, VHB



Arlington Self-Storage Facility | Arlington, MA

Legend

- Project Area
- Flood Zone Designations
- AE: 1% Annual Chance of Flooding, with BFE
- AE: Regulatory Floodway
- X: 0.2% Annual Chance of Flooding

Figure 4 - FEMA Map
Source Info: USGS, MassGIS, VHB

Attachment A
Notice of Intent Narrative

- Introduction
- Site Description
- Work Description
- Mitigation Measures
- Regulatory Compliance
- Summary

Attachment A - Notice of Intent Narrative

This Notice of Intent (NOI) is filed pursuant to the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40) and its implementing regulations (310 CMR 10.00) and the Town of Arlington's Wetlands Protection Bylaw[1] (the Bylaw). This narrative describes wetland resource areas associated with the Project Site, the proposed work, impacts to wetland resource areas, mitigation measures, and how the Project meets the performance standards of the WPA and the Bylaw. Refer to the accompanying Project plans included as Attachment E (bound separately) for a layout and details of the Project components.

Introduction

The Applicant, PSI Atlantic Arlington MA LLC, is proposing to construct a five-story self-storage facility and remove a failing retaining wall on the adjacent parcel (the Project) located at 34 Dudley Street and at 0 Lot Grove Street, respectively (collectively referred to as the 'Project Site') in Arlington, MA. Proposed work generally consists of removing the existing building and garage, installing the stormwater system and associated drainage features, constructing the new storage facility, repaving the lot, and revegetating areas of the Project Site. Proposed work also includes removing the existing retaining wall and regrading and stabilizing the slope on the Town-owned parcel. As proposed, the Project consists of 95,700± square feet (sf) of building space, ancillary landscape improvements, parking spaces (11), and utility improvements to support this use.

Portions of land on or near the Project Site contain resource areas subject to the jurisdiction of the WPA and the Bylaw, including Bank and 200-foot Riverfront Area (RA). The WPA and the Bylaw establish a 100-foot buffer zone to Bank. The Bylaw also establishes a 100-foot Adjacent Upland Resource Area (AURA), with specific limitations within 25 feet and 50 feet of resource areas. All resource areas are associated with Mill Brook, which runs adjacent to the Town-owned parcel. As proposed, the Project will result in impacts within the RA, 100-foot AURA, and buffer zone to Bank.

Wetland resource areas will be protected from impacts during construction through the implementation of an erosion and sedimentation control program. This program includes provisions to limit erosion through stabilization and prevent sediment from leaving the site by installing structural controls. Runoff generated from the Project will

[1] Town of Arlington, 2018. Arlington Regulations for Wetlands Protection.

be collected and treated in accordance with design guidelines[2] developed by Department of Environmental Protection (DEP) and standards contained in the WPA Regulations. Refer to the accompanying Stormwater Management Report included as Attachment D for details of the Project's compliance with the DEP Stormwater Standards.

Site Description

The Project Site has an area of approximately 0.75 acres and is located at 34 Dudley Street (Map 55 Parcel 2-39.B) and a limited portion of the adjacent Town-owned parcel (Map 54 Parcel 1-1) in Arlington, MA (See Figure 1 USGS Map and Figure 2 Aerial Map). The Project Site includes a previously developed commercial lot and a portion of the Town-owned parcel which is forested and steeply sloping to the brook. At the rear of 34 Dudley Street behind the existing stockade fence, there is a steep drop in elevation on the slope. A chain-link fence acts as a retaining wall here, holding stone and soil in place on what would otherwise be a steep, unstable slope. Refer to the attached Photography Log (Attachment C) for images of the existing conditions. The Project Site is bounded primarily by industrial properties to the north, east, and west, while Mill Brook is located south of the Project Site.

According to the most recently available data provided by the Massachusetts Natural Heritage and Endangered Species Program[3] (NHESP), no portion of the Project Site is located within Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife, nor are there any Certified or Potential Vernal Pools on the Project Site (Figure 3).

The Project Site does not lie within any Area of Critical Environmental Concern[4] (ACEC). According to the most recent information provided by MassDEP, the Project Site is not located in an area designated as an Outstanding Resource Water[5], and no portion of the Project Site is located within a Zone II Interim Wellhead Protection Area[6].

The most recently issued Flood Insurance Rate Maps[7] (FIRM) for the area produced by the Federal Emergency Management Agency (FEMA) indicate that no portions of the Project Site are within mapped flood zones. South of the Project Site, Mill Brook is mapped as a Regulatory Floodway (Figure 4).

The Natural Resources Conservation Service[8] (NRCS) soil survey has mapped the majority of the Project Site as Udorthents, wet substratum with a small portion of the site mapped as Merrimac-Urban land complex, 0 to 8 percent slopes.

[2] DEP, 2008. Massachusetts Stormwater Handbook.

[3] NHESP, 2021. *Massachusetts Natural Heritage Atlas, 15th Edition*.

[4] Massachusetts Executive Office of Energy and Environmental Affairs, 2009.

[5] MassDEP, 2010. Designated Outstanding Resource Waters of Massachusetts

[6] MassDEP, 2012. Approved Wellhead Protection Areas (Zone II).

[7] Federal Emergency Management Agency, National Flood Hazard Layer, Digital Flood Insurance Rate Map (DFIRM).

[8] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey.

Topography on the Project Site is generally flat, but immediately south of the property line slopes down steeply toward Mill Brook. Wetland resource areas on/near the Project are described below.

Wetland Resource Areas

Wetland resource areas on/near the Project Site were delineated in October 2021 by environmental scientists with Vanasse Hangen Brustlin, Inc. in accordance with methods developed by the DEP[9] and the U.S. Army Corps of Engineers[10]. The following sections of this narrative describe the wetlands and identify resource areas that are regulated under the WPA Regulations (310 CMR 10.00) and/or the Bylaw. The resource areas and their buffer zones are depicted on the attached Project Plans (Attachment E).

The resource areas identified on or near the Project Site subject to state regulations under the WPA include Bank and Riverfront Area. The resource areas are defined under the WPA (310 CMR 10.00) as follows:

- **Bank**: As defined at 310 CMR 10.54 (2), *"a Bank is the portion of the land surface which normally abuts and confines a water body … The upper boundary of Bank is the first observable break in slope or the mean annual flood level, whichever is lower."*
- **RA:** As defined by 310 CMR 10.58 (2)(a)(3), Riverfront Area is *"the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away…"*

An additional resource area established under the Bylaw is the 100-foot Adjacent Upland Resource Area. The AURA is defined as the area within 100 feet of a resource area; in this case, Bank. The AURA also includes:

- 25-foot No Disturb Zone (NDZ) – the innermost 25 feet of the 100-foot AURA
- 50-foot No Build Zone (NBZ) – the inner 50 feet of the 100-foot AURA

Wetlands and their buffer zones on/adjacent to the property are described in more detail in the following sections of this attachment.

Mill Brook

Mill Brook is a perennial waterway that flows west to east south of the Project Site. The banks of the brook are a hardscaped stone wall, with moss and a few herbaceous species vegetating on and around the stone. Typical species present along the Bank above and within the wall include Japanese knotweed (*Fallopia japonica*), poison ivy (*Toxicodendron radicans*), box elder (*Acer negundo*), sycamore maple (*Acer pseudoplatanus*), Norway maple (*Acer platanoides*), and American elm (*Ulmus americana*).

[9] DEP, 1995. Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act.

[10] USACE, 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region, Version 2.0.

Mill Brook supports Bank and a 200-foot RA extending 200 feet from the mean annual high-water line of Mill Brook, which is coincident with Bank. The RA of Mill Brook has a narrow strip of disturbed, vegetated land (less than 10 feet wide) extending from the Bank. Here, there is a walking path which exists parallel to the Brook. North of the path, the land is steeply sloped leading up toward the Project Site. The area between the top of Bank and the top of slope is dominated by Japanese knotweed, American elm, and Norway and sycamore maples.

At the top of the slope, the majority of the RA is previously developed with buildings and paved surface lots. Almost all of the Project Site is located within the 200-foot RA.

Buffer Zone

The WPA regulations (310 CMR 10.02(2)(b)) establish a 100-foot buffer zone from the limits of Bank as described above. The area within the buffer zone is essentially the same as the RA described above, but the buffer zone only extends about halfway into the Project Site. The northwest corner of the existing garage is the approximate limit of the buffer zone.

Adjacent Upland Resource Area

Conditions in the AURA are the same as those in the 100-foot buffer zone described above.

Work Description

The Applicant is proposing redevelopment of the Project Site to construct a five-story self-storage facility on the western half of the parcel. Before construction can begin, the existing structures on the site will be demolished. These include a three-story building and a small garage. New construction will include the 95,700± sf five-story storage facility on the west side of the parcel with a paved entranceway and parking spaces on the east side of the parcel. In the proposed condition, there will be a subsurface infiltration system and bioretention basin located east of the storage facility. Additional work proposed as enhancement to the Project Site includes removal of the chain-link fence retaining wall south of the property and regrading and re-stabilization of the slope. Vegetation removal will be avoided to the extent practicable, but in the case that removal is needed beyond what is presented in this NOI in order to complete construction activities, a request for vegetation removal will be filed and replacement plantings will be made as required under the Bylaw. Similarly, if any work on the slope near the brook must extend beyond the defined limits of work as a result of existing field conditions, immediate notice will be made to the Commission and appropriate measures will be followed.

Detailed means and methods of construction will be at the discretion and responsibility of the contractor performing the work. However, the Project will consist of the following general activities:

- Before any work begins, installing erosion and sedimentation controls according to the Project Plans;
- Building demolition and perimeter fence removal;
- New building construction;
- Installation of stormwater system and utilities;
- Loaming and seeding; and
- After soils have stabilized, removing erosion controls.

Work in Riverfront Area & Buffer Zone

Work in RA and the 100-foot buffer zone is described below. This work fully complies with all applicable performance standards as demonstrated in the Regulatory Compliance section of this Narrative.

Work in Riverfront Area

Proposed work in the RA includes most of the work within the Project Site. Within the inner 100 feet of the RA (the "inner riparian zone"), this includes removal of existing fencing, portions of pavement and the existing drainage system, and the garage and three-story building. Proposed work then includes installing the underground detention system and bioretention basin, and construction of the storage facility. Work also includes removing the makeshift-retaining wall on the adjacent Town-owned property and regrading and restoring the existing slope. The slope is currently degraded, as can be seen in the attached Photo Log (Attachment C). The slope will be regraded to have a more gradual rise, and erosion control blankets will be installed after grading in order to stabilize the slope. Work on the slope will occur from the existing pavement to prevent unnecessary disturbance to Mill Brook downslope.

In the outer 100 feet of the RA, proposed work also includes removal of the existing pavement, drainage system, and three-story building, followed by construction of the storage facility.

Work within RA on the Project Site includes a total of 32,718 sf of impacts. As a result of the proposed work, there will be a 4,240 sf reduction in impervious surface within RA on the Project Site. Additionally, proposed plantings around the facility will help restore these areas of the inner and outer riparian zones to a more natural condition. A Planting Plan has been prepared to accompany this NOI and can be found on Sheets L1.01 and L2.01 in Attachment E. Some native species proposed for planting in the inner riparian zone include 21 eastern red cedars (*Juniperus virginiana)* and five red maples (*Acer rubrum*).

Work in Buffer Zone

Work in the state-jurisdictional buffer zone is the same as the work proposed in the inner 100-feet of the RA as described above.

Work in Locally Jurisdictional Resource Areas

Work in the AURA is the same as the work described in the inner 100-feet of the RA. The AURA has additional limitations on work within 25 feet and 50 feet of a resource area. Work proposed in the 25-foot NDZ is limited to regrading and restoration of the steep slope located on the Town-owned parcel. The intent is to restore the stability and slight grade of the slope, which will be an improvement over its existing condition. Work within the 50-foot NBZ includes a small area of the storage facility. This work is proposed on an existing disturbed footprint.

Mitigation Measures

A suite of mitigation measures is proposed to prevent short- and long-term impacts to wetland resource areas. Mitigation measures proposed for this project include an erosion and sedimentation control program, which will include structural and non-structural practices.

Erosion and Sediment Control

An erosion and sedimentation control program will be implemented to minimize temporary impacts to wetland resource areas during the construction phase of the project. The program incorporates Best Management Practices (BMPs) specified in guidelines developed by the DEP[11] and the U.S. Environmental Protection Agency[12] (EPA).

Proper implementation of the erosion and sedimentation control program will:

- minimize exposed soil areas through sequencing and temporary stabilization;
- place structures to manage stormwater runoff and erosion; and
- establish a permanent vegetative cover or other forms of stabilization as soon as practicable.

The following sections describe the controls that will be used and practices that will be followed during construction. These practices comply with criteria contained in the NPDES General Permit for Discharges from Large and Small Construction Activities issued by the EPA.

Non-Structural Practices

Non-structural practices to be used during construction include temporary stabilization, temporary seeding, permanent seeding, and dust control. These practices will be initiated as soon as practicable in appropriate areas at the site.

[11] DEP, 1997. *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide for Planners, Designers, and Municipal Officials*.

[12] EPA, 2007. *Interim Developing Your Stormwater Pollution Prevention Plan: A Guide for Construction Sites*. Office of Water. Report EPA 833-R-060-04.

Temporary Stabilization

Any areas of exposed soil or stockpiles that will remain inactive for more than 14 days will be covered with a layer of straw mulch applied at a rate of 90 pounds per 1,000 square feet. The mulch will be anchored with a tacking coat (non-tar) applied by a hydroseeded. Steeper slopes (greater than 10 percent) will be covered with a bonded fiber matrix (EcoAegis® or similar) according to the recommendations provided by the manufacturer.

Temporary Seeding

If conditions allow, a temporary vegetative cover will be established on areas of exposed soils (including stockpiles) that remain unstabilized for a period of more than 14 days. The seeded surfaces will be covered with a layer of straw mulch or bonded fiber matrix as described above. The seed mix shall include a blend of rapid germinating grasses that are indigenous to eastern Massachusetts.

Permanent Seeding

Upon completion of final grading, any areas not covered by pavement, other forms of stabilization, or other methods of landscaping will be seeded with New England Conservation/Wildlife mix produced by New England Wetland Plants, Inc. This seed mix includes Virginia wild rye (*Elymus virginicus*), little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), red fescue (*Festuca rubra*), switch grass (*Panicum virgatum*), partridge pea (*Chamaecrista fasciculata*), panicledleaf tick trefoil (*Desmodium paniculatum*), indian grass (*Sorghastrum nutans*), blue vervain (*Verbena hastata*), butterfly milkweed (*Asclepias tuberosa*), black eyed Susan (*Rudbeckia hirta*), common sneezeweed (*Helenium autunale*), heath aster (*Asterpilosus/Symphyotrichum pilosum*), early goldenrod (*Solidago juncea*), upland bentgrass (*Agrostis perennans*). The mix will be applied at a rate of 25 pounds per acre and will be covered with mulch or bonded fiber matrix as described above. Refer to the Project's Planting Plan (Sheets L1.01 and L2.01 - Attachment E) for complete planting details.

Dust Control

The erosion and sediment control program includes provisions to minimize the generation of dust during dry and windy conditions. When necessary, larger areas of exposed soil will be wetted to prevent wind borne transport of fine-grained sediment. Enough water shall be applied to wet the upper 0.5 inches of soil. The water will be applied as a fine spray to prevent erosion. A water truck will be kept on the property (or at a nearby location) to facilitate this practice.

Structural Practices

Structural erosion and sedimentation controls to be used on the site include barriers, catch basin inlet protection, stabilized construction exits, and temporary sediment basins.

Erosion Control Barriers

Prior to any ground disturbance, approved erosion control barriers will be installed at the limits of work. As construction progresses, additional barriers will be installed around the base of stockpiles and other erosion prone areas.

If sediment has accumulated to a depth which impairs proper functioning of the barrier, it will be removed by hand or by machinery operating upslope of the barriers. This material will be either reused at the Project Site or disposed of at a suitable offsite location. Any damaged sections of the barrier will be repaired or replaced immediately upon discovery.

Catch Basin Inlet Protection

The inlets of existing and proposed catch basins will be protected from sediment inflow during the work period by surrounding them with a barrier of staked straw bales or by installing Silt Sacks®. If straw bales are used, a layer of non-woven filter fabric shall be placed beneath the grate of each basin. If sediment has collected behind the barrier or in the Silt Sack® to a point where it impairs proper functioning, it will be removed and will be either reused onsite or disposed of at a suitable offsite location.

Stabilized Construction Exits

Stone anti-tracking pads will be installed at each access point to the work area to prevent the offsite transport of sediment by construction vehicles. The stabilized construction exits will be at least fifty feet long and will consist of a 4-inch-thick layer of crushed stone (1.5 inches in diameter). The stone will be placed over a layer of non-woven filter fabric. The anti-tracking pads will remain in place until a binder coat of pavement has been established on paved surfaces.

Temporary Sediment Basins

Temporary sediment basins will be designed either as excavations or bermed structures (depending on grading) that will retain runoff for enough time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from the basin will be stabilized to minimize erosion.

Once constructed, the basins will be temporarily stabilized by covering them with bonded fiber matrix. If sediment has accumulated to a depth which impairs proper functioning of the basin, it will be removed and will be either reused on the site or disposed of at a suitable offsite location. Any eroded or damaged areas will be repaired immediately upon discovery.

Stormwater Management

Runoff generated from impervious surfaces will be collected and managed in accordance with the DEP policy. A stormwater management system will be constructed

that includes measures to provide groundwater recharge, attenuate peak flows, and provide water quality treatment. Full details on the system (including supporting calculations) are included in the accompanying Stormwater Report (Attachment D).

Compliance with the 10 stormwater management standards cited in Section 310 CMR 10.05(6)(k) of the WPA Regulations is evaluated in the Regulatory Compliance section of the Stormwater Report.

Regulatory Compliance

As demonstrated below, the Project work fully complies with applicable performance standards contained in the WPA for RA and will protect the interests of the Bylaw. Compliance with each of the applicable performance standards is described in more detail below.

Work in Riverfront Area

As demonstrated below, work proposed in the Riverfront Area complies with the requirements contained in 310 CMR 10.58(5):

Notwithstanding the provisions of 310 CMR 10.58(4)(c) and (d), the issuing authority may allow work to redevelop a previously developed riverfront area, provided the proposed work improves existing conditions … Work to redevelop previously developed riverfront areas shall conform to the following criteria:

> *(a) At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40. When a lot is previously developed but no portion of the riverfront area is degraded, the requirements of 310 CMR 10.58(4) shall be met.*
>
> Work proposed in the RA will improve the existing condition of the RA on the Project Site by removing 4,240 sf of impervious surface as well as a structure (he retaining wall) located within the RA, planting native species within those newly permeable areas, and adding a subsurface infiltration system and a bioretention basin as part of a new stormwater management system.
>
> *(b) Stormwater management is provided according to standards established by the Department.*
>
> Stormwater management measures on the Project Site meet or exceed the standards established by the DEP.
>
> *(c) Within 200-foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25-foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).*
>
> Proposed work within the RA is not located closer to the Brook than the existing conditions. The existing retaining wall is a degraded structure within the RA failing to uphold the existing slope. Temporary work to remove this structure, regrade the

slope, and install erosion control blankets in this area represents an improvement over existing conditions.

(d) Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).

Proposed work will be contained within existing degraded areas of the RA and no proposed structures will be located in areas closer to the brook beyond what is currently degraded. Contrarily, this Project proposes removal of an existing structure within the RA.

(e) The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).

The area of proposed work will not exceed the amount of degraded area on the Project Site.

(f) When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration. Alteration not conforming to the criteria shall begin at the riverfront area boundary.

Restoration of the RA is not proposed due to Project impacts. However, the portion of the RA containing the retaining wall will be restored by removing the existing structure, regrading the steep slope, and stabilizing the slope with erosion control blankets.

Work in Buffer Zone

Work within buffer zone is not governed by specific regulatory performance standards in the WPA or the Bylaw. In general, work within buffer zones is permissible when said work has been designed, or can be conditioned, such that there will be no impact on the downgradient wetland resource area(s) being buffered. As identified in 310 CMR 10.53(1) of the WPA regulations:

For work in Buffer Zone subject to review under 310 CMR 10.02(2)(b)3., the issuing authority should consider the characteristics of the buffer zone, such as the presence of steep slopes, that may increase the potential for adverse impacts on resource areas. Conditions may include limitations on the scope and location of work in the buffer zone as necessary to avoid alteration of resource areas. The issuing authority may require erosion and sedimentation controls during construction, a clear limit of work, and the preservation of natural vegetation adjacent to the resource area and/or other measures commensurate with the scope and location of the work within the buffer zone to protect the interests of the Act.

The proposed Project has been designed to address these requirements. In addition to construction of the storage facility, work within the 100-foot buffer zone includes removal of 4,240 sf of impervious surface, stabilizing the slope north of the brook, adding a subsurface infiltration system and a bioretention basin, and planting of native species—all of which represent an improvement to the Project Site over existing conditions.

Additionally, as identified in the Mitigation Measures section of this attachment, an erosion and sedimentation control program will be implemented to prevent adverse impacts during and after construction.

Work in Locally Established Resource Areas

As the majority of the Project Site is located within the existing degraded 100-foot Adjacent Upland Resource Area, work within the resource area is unavoidable and will provide some improvements to the current condition. The proposed Project has been designed to protect the interests of the Bylaw. As stated in the Bylaw in Section 25:

> *D. No activities or work, other than passive passage and resource area enhancement, are permitted within the first 25 feet of the Adjacent Upland Resource Area … no vegetation may be disturbed, and leaf litter and natural debris shall remain in place. This No-Disturbance area shall at a minimum contain the same amount of area of undisturbed and natural vegetation from its pre-project state. A previously disturbed or previously developed 25-foot area shall be restored to a naturally vegetated state to the greatest extent practicable*

Work within the 25-foot NDZ is limited to restoration of the previously disturbed steep slope which leads down to Mill Brook. The proposed work in this area will result in an improvement over existing conditions.

Also stated in Section 25 of the Bylaw:

> *E. No new structure(s) shall be placed in the first 50 feet of the Adjacent Upland Resource Area … unless approved by the Commission in evaluation of existing total impervious surface (see Section F below) within the 50-foot area compared to the proposed impervious surface, and other considerations for the improvement of the resource area and climate change resiliency.*
>
> *F. Impervious surface.*
>
> > *(1) The total area of impervious surface within the Adjacent Upland Resource Area shall not increase over existing total area unless mitigation is provided and there is no impact on Resource Area values.*
> >
> > *(2) Impervious surfaces shall not intrude farther into the Adjacent Upland Resource Area than pre-project conditions unless the Commission in its sole discretion determines that the total area of impervious surface is significantly decreased or other mitigation is provided that serves to protect the resource area values. Impervious surface shall be kept as close as possible to the outer (upland) boundary of the Adjacent Upland Resource Area.*

Proposed work in the 50-foot No Build Zone includes construction of a small portion of the self-storage facility; however, the NBZ is currently paved in this area. The total area of impervious surface within the AURA will decrease from the existing total area because of the proposed work, and there is no anticipated impact on Resource Area values. Additionally, the extent of the new building's layout will be located farther from Mill Brook than the existing impervious footprint.

Climate Change Resilience

As required in Section 31 of the Bylaw, considerations of adaptation planning have been integrated into the Project to the extent practicable to promote climate change resilience so as to protect and promote resource area values into the future.

To accommodate stormwater and potential surface runoff, both an underground infiltration system and bioretention basin will be installed on the Project Site. Additional information on the proposed stormwater system can be found in the attached Stormwater Management Report (Attachment D). In addition, the Project Site will be revegetated with native plants recommended by the Arlington Conservation Commission. Additional information on the species, quantities, and locations of plantings can be found in the attached Planting Plan. The Project Site is at least 10 feet higher in elevation than Mill Brook and is located outside of the 100-year floodplain associated with the waterway. Therefore, there are no anticipated impacts to the proposed building and related amenities as a direct result of increased flooding due to climate change.

Summary

The Applicant is proposing to construct a five-story self-storage facility at 34 Dudley Street and remove a failing retaining wall on the adjacent parcel in Arlington, MA. Proposed work generally consists of removing the existing building and garage, installation of the stormwater system and associated drainage features, construction of the new storage facility, repaving of the lot, and revegetation within the Project Site. Proposed work also includes removing the existing retaining wall and regrading and stabilizing the slope on the Town-owned parcel.

As proposed, the Project will result in impacts within RA and the 100-foot buffer zone to Bank, as well as the 100-foot Adjacent Upland Resource Area. All work will occur within previously developed areas. A suite of mitigation measures is proposed to prevent short- and long-term impacts to resource area buffer zones. Mitigation measures proposed include an erosion and sedimentation control program, which will include structural and non-structural practices.

The Applicant respectfully requests that the Arlington Conservation Commission find these measures adequately protective of the interests identified in the WPA and the Bylaw and issue an Order of Conditions approving the work described in this NOI and shown on the accompanying plans.

Attachment B
Abutter Information

- Notice to Abutters
- Affidavit of Service
- List of Abutters

Abutter Notification

Notification to Abutters Under the Massachusetts Wetlands Protection Act And Arlington Wetlands Protection Bylaw

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Arlington Wetlands Protection Bylaw, you are hereby notified of the following:

The Conservation Commission will hold a virtual public meeting using Zoom, on *Thursday, March 3rd* at *7:30 pm* in accordance with the provisions of the Mass. Wetlands Protection Act (M.G.L. Ch. 131, s. 40, as amended), the Town of Arlington Bylaws Article 8, Bylaw for Wetland Protection, and in accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, for a Notice of Intent from *PSI Atlantic Arlington MA, LLC,* for *redevelopment of the property located at 34 Dudley St for the construction of a 5-story self-storage facility,* within *200 feet of a Riverfront*, on Assessor's Property Map/s #55, Lot/s #2-39.B. Please refer to the Commission's online meeting agenda for specific Zoom meeting access information.

A copy of the application and accompanying plans are available by request by contacting the Arlington Conservation Agent at 781-316-3229 or mmuszynski@town.arlington.ma.us. For more information, call the applicant's Representative at 617-607-6310 or the Arlington Conservation Commission at 781-316-3229, or the DEP Northeast Regional Office at 978-694-3200.

NOTE: Notice of the Public Hearing will be published at least five (5) business days in advance in *The Arlington Advocate* and will also be posted at least 48 hours in advance on the Arlington Town Hall website.

****

The meeting information for your hearing is:

Date: **Thursday March 3, 2022**

Time: **7:30 pm**

Affidavit of Service

(Please return to Conservation Commission)

I,_____Taylor Donovan_____ , being duly sworn, do hereby state as follows: on ____2/17/2022_____, I mailed a "Notification to Abutters" in compliance with the second paragraph of Massachusetts General Laws, Chapter 131, s.40, the DEP Guide to Abutter Notification dated April 8, l994, and the Arlington Wetlands Protection Bylaw, Title V, Article 8 of the Town of Arlington Bylaws in connection with the following matter:

Redevelopment of the property located at 34 Dudley St for the construction of a 5-story self-storage facility.

The form of the notification, and a list of the abutters to whom it was provided and their addresses, are attached to this Affidavit of Service.

Signed under the pains and penalties of perjury, this _17th_ day of __February___.



_____

Name

Office of the Board of Assessors
Robbins Memorial Town Hall
Arlington, MA 02476
(781) 316-3050
Assessors@town.arlington.ma.us

Abutters List

Date: January 06, 2022

Subject Property Address: 34 DUDLEY ST Arlington, MA
Subject Property ID: 55-2-39.B

Search Distance: 100 Feet - Conservation

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters to a single parcel within 100 feet.

Robert E. Greeley

Board of Assessors


Brattle St
Dudley St
Minuteman Bikeway
Brattle Dr
Grove Street Pl
Mill Brook
Massachusetts Ave
Walnut St
Places by Category
Police Station
Fire Station
School
Library
Public Works
Recreation - Facilities
Recreation - Fields Courts
Recreation - Fields Courts
Open Space: Conservation
Open Space - Minuteman I
Open Space - Labels
Open Space
Town, State, or Priva
Other Town Owned
MA Highways
Interstate
US Highway
Numbered Routes
Abutting Towns
Town Boundary
Parcels
Buildings
Cemetery - Roads
Road1
Road2
Road3
Road4
Pavement Markings
Impervious Surface - For B
Street
Sidewalk
Street Island
Driveway
Parking Lot
Bike Path
Roads - For Large Scale (f
Roads - For Small Scale (f
Major Road
Local Road
Master Plan Base Map - M
Water Line
Water Body
The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.
200
400 ft
Printed on 01/06/2022 at 10:22 AM

Abutters List
Date: January 06, 2022
Subject Property Address: 34 DUDLEY ST Arlington, MA
Subject Property ID: 55-2-39.B
Search Distance: 100 Feet

Prop ID: 54-1-1
Prop Location: 0-LOT GROVE ST Arlington, MA
Owner: TOWN OF ARLINGTON PARK
Co-Owner: ETHEL WELLINGTON PARK
Mailing Address:
730 MASS AVE
ARLINGTON, MA 02476

Prop ID: 55-1-10
Prop Location: 39 DUDLEY ST Arlington, MA
Owner: CHILLEMI JUSTIN P
Co-Owner:
Mailing Address:
54A CLEVELAND STREET
ARLINGTON, MA 02474

Prop ID: 55-1-11.A
Prop Location: 37 DUDLEY ST Arlington, MA
Owner: CHILLEMI JUSTIN
Co-Owner:
Mailing Address:
39 DUDLEY ST
ARLINGTON, MA 02476

Prop ID: 55-1-11.B
Prop Location: 33-35 DUDLEY ST Arlington, MA
Owner: CAMPBELL RICHARD A & SETA
Co-Owner:
Mailing Address:
174 BOYLSTON STREET
WATERTOWN, MA 02472

Prop ID: 55-1-12.A
Prop Location: 29 DUDLEY ST Arlington, MA
Owner: CARNEY JOHN A
Co-Owner:
Mailing Address:
98 RICHFIELD RD
ARLINGTON, MA 02474

Prop ID: 55-1-13.A
Prop Location: 25 DUDLEY ST Arlington, MA
Owner: CARNEY JOHN A
Co-Owner:
Mailing Address:
98 RICHFIELD RD
ARLINGTON, MA 02474

Prop ID: 55-1-14
Prop Location: 23 DUDLEY ST Arlington, MA
Owner: MALONEY SEAN P/TRUSTEE
Co-Owner: OXBOW REALTY TRUST
Mailing Address:
P. O. BOX 515
LEXINGTON, MA 02420

Prop ID: 55-1-8
Prop Location: 43 DUDLEY ST Arlington, MA
Owner: 47 DUDLEY STREET LLC
Co-Owner:
Mailing Address:
1 CHURCHILL PL
ARLINGTON, MA 02476

Prop ID: 55-1-9
Prop Location: 41-41A DUDLEY ST Arlington, MA
Owner: PIGOTT CHARLES A & JANE F
Co-Owner:
Mailing Address:
1 CHURCHILL PL
ARLINGTON, MA 02476

Prop ID: 55-2-1.A
Prop Location: 32 PRENTISS RD Arlington, MA
Owner: J & G PRENTISS LLC
Co-Owner:
Mailing Address:
32 PRENTISS RD
ARLINGTON, MA 02476

Prop ID: 55-2-34
Prop Location: 14 DUDLEY CT Arlington, MA
Owner: 14 DUDLEY COURT LLC
Co-Owner:
Mailing Address:
6 EAST RD
SOUTH CHATHAM, MA 02659

Prop ID: 55-2-38.A
Prop Location: 42 DUDLEY ST Arlington, MA
Owner: VALERI ROBERT E TRS--ETAL
Co-Owner: VALERI LORETTA J
Mailing Address:
PO BOX 532
WOBURN, MA 01801

Prop ID: 55-2-38.B
Prop Location: 38 DUDLEY ST Arlington, MA
Owner: VALERI ROBERT E TRS--ETAL
Co-Owner: VALERI LORETTA J
Mailing Address:
PO BOX 532
WOBURN, MA 01801

Prop ID: 55-2-38.C
Prop Location: 40-R DUDLEY ST Arlington, MA
Owner: VALERI ROBERT E TRS--ETAL
Co-Owner: VALERI LORETTA J
Mailing Address:
PO BOX 532
WOBURN, MA 01801

Prop ID: 55-2-39.A
Prop Location: 36-R DUDLEY ST Arlington, MA
Owner: GREENE BRUCE
Co-Owner: JOHNSON LOUISE M
Mailing Address:
36R DUDLEY STREET
ARLINGTON, MA 02476

Prop ID: 55-2-39.B
Prop Location: 34 DUDLEY ST Arlington, MA
Owner: 34 DUDLEY STREET LLC
Co-Owner:
Mailing Address:
34 DUDLEY STREET
ARLINGTON, MA 02476

Prop ID: 55-2-41
Prop Location: 26 DUDLEY ST Arlington, MA
Owner: SANTINI MARK & GARY--TRS
Co-Owner: SANTINI REALTY TRUST
Mailing Address:
P.O. BOX 93
ARLINGTON, MA 02476

Prop ID: 55.B-1-101
Prop Location: 993 MASS AVE UNIT 101 Arlington, MA
Owner: BUCHANAN ELAINE M
Co-Owner:
Mailing Address:
76 BEECH ST UNIT 2
BELMONT, MA 02478

Prop ID: 55.B-1-102
Prop Location: 993 MASS AVE UNIT 102 Arlington, MA
Owner: LIN JANE E
Co-Owner: LEE KEN A
Mailing Address:
993 MASS AVENUE #102
ARLINGTON, MA 02476

Prop ID: 55.B-1-103
Prop Location: 993 MASS AVE UNIT 103 Arlington, MA
Owner: MC KINNON GARRETT
Co-Owner:
Mailing Address:
239 PLEASANT STREET
ARLINGTON, MA 02476

Prop ID: 55.B-1-104
Prop Location: 993 MASS AVE UNIT 104 Arlington, MA
Owner: FABIANO DIANE M
Co-Owner:
Mailing Address:
993 MASS AVE #104
ARLINGTON, MA 02474

Prop ID: 55.B-1-105
Prop Location: 993 MASS AVE UNIT 105 Arlington, MA
Owner: URBAN JULIE A/ TRUSTEE
Co-Owner: JULIE A URBAN REVOCABLE LIVING
Mailing Address:
993 MASS AVE #105
ARLINGTON, MA 02476

Prop ID: 55.B-1-106
Prop Location: 993 MASS AVE UNIT 106 Arlington, MA
Owner: BOWES ROBERT E & ELAINE M/ TRS
Co-Owner: ROBERT E BOWES TRUST
Mailing Address:
26 LAKEVIEW
ARLINGTON, MA 02476

Prop ID: 55.B-1-107
Prop Location: 993 MASS AVE UNIT 107 Arlington, MA
Owner: SHANNON VIRGINIA A LIFE ESTATE
Co-Owner:
Mailing Address:
993 MASS AVENUE #107
ARLINGTON, MA 02476

Prop ID: 55.B-1-108
Prop Location: 993 MASS AVE UNIT 108 Arlington, MA
Owner: HART ASHLEY
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE
UNIT 108
ARLINGTON, MA 02476

Prop ID: 55.B-1-109
Prop Location: 993 MASS AVE UNIT 109 Arlington, MA
Owner: LENNEY CHRISTOPHER
Co-Owner:
Mailing Address:
993 MASS AVENUE #109
ARLINGTON, MA 02476

Prop ID: 55.B-1-110
Prop Location: 993 MASS AVE UNIT 110 Arlington, MA
Owner: REED MARY ELLEN
Co-Owner:
Mailing Address:
993 MASS AVE #110
ARLINGTON, MA 02476

Prop ID: 55.B-1-111
Prop Location: 993 MASS AVE UNIT 111 Arlington, MA
Owner: OSHEA EILEEN
Co-Owner:
Mailing Address:
993 MASS AVE #111
ARLINGTON, MA 02476

Prop ID: 55.B-1-112
Prop Location: 993 MASS AVE UNIT 112 Arlington, MA
Owner: LIN CHUAN
Co-Owner: CAO HUAIGU
Mailing Address:
993 MASS AVENUE #112
ARLINGTON, MA 02476

Prop ID: 55.B-1-113
Prop Location: 993 MASS AVE UNIT 113 Arlington, MA
Owner: SHEEHAN MEAGHAN
Co-Owner:
Mailing Address:
581 OLD STRAWBERRY HILL RD
CENTERVILLE MA, MA 02632

Prop ID: 55.B-1-114
Prop Location: 993 MASS AVE UNIT 114 Arlington, MA
Owner: IKEMOTO BRIAN Y
Co-Owner:
Mailing Address:
40 GILMAN ST
SOMERVILLE, MA 02145

Prop ID: 55.B-1-115
Prop Location: 993 MASS AVE UNIT 115 Arlington, MA
Owner: CLERMONT JACQUELYN M
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE #115
ARLINGTON, MA 02476

Prop ID: 55.B-1-117
Prop Location: 993 MASS AVE UNIT 117 Arlington, MA
Owner: CHYI SHYUE-LING
Co-Owner:
Mailing Address:
993 MASS AVENUE #117
ARLINGTON, MA 02476

Prop ID: 55.B-1-118
Prop Location: 993 MASS AVE UNIT 118 Arlington, MA
Owner: WONG ELIZABETH & MAYWOOD
Co-Owner: MARTIN PATRICIA
Mailing Address:
993 MASS AVENUE UNIT 118
ARLINGTON, MA 02476

Prop ID: 55.B-1-119
Prop Location: 993 MASS AVE UNIT 119 Arlington, MA
Owner: KUNSMAN JANET M
Co-Owner:
Mailing Address:
134 WOODSIDE LANE
ARLINGTON, MA 02474

Prop ID: 55.B-1-120
Prop Location: 993 MASS AVE UNIT 120 Arlington, MA
Owner: BAGHDADI REZA
Co-Owner: SOLOUKI SAEIDEH
Mailing Address:
993 MASS AVE #201
ARLINGTON, MA 02476

Prop ID: 55.B-1-121
Prop Location: 993 MASS AVE UNIT 121 Arlington, MA
Owner: PANTAZOPOULOS NICHOLAS
Co-Owner:
Mailing Address:
993 MASS AVE #121
ARLINGTON, MA 02476

Prop ID: 55.B-1-122
Prop Location: 993 MASS AVE UNIT 122 Arlington, MA
Owner: LIVINGSTONE DAVID J
Co-Owner:
Mailing Address:
993 MASS AVENUE #122
ARLINGTON, MA 02476

Prop ID: 55.B-1-123
Prop Location: 993 MASS AVE UNIT 123 Arlington, MA
Owner: ARLINGTON HOUSING AUTHORITY
Co-Owner:
Mailing Address:
4 WINSLOW ST
ARLINGTON, MA 02476

Prop ID: 55.B-1-124
Prop Location: 993 MASS AVE UNIT 124 Arlington, MA
Owner: WILEY JUSTIN
Co-Owner:
Mailing Address:
993 MASS AVE #124
ARLINGTON, MA 02476

Prop ID: 55.B-1-125
Prop Location: 993 MASS AVE UNIT 125 Arlington, MA
Owner: CLABAUGH JERRY A
Co-Owner:
Mailing Address:
993 MASS AVENUE #125
ARLINGTON, MA 02476

Prop ID: 55.B-1-126
Prop Location: 993 MASS AVE UNIT 126 Arlington, MA
Owner: EISENHART HENRY
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 126
ARLINGTON, MA 02476

Prop ID: 55.B-1-127
Prop Location: 993 MASS AVE UNIT 127 Arlington, MA
Owner: PASQUALE FRANCO
Co-Owner:
Mailing Address:
993 MASS AVE #127
ARLINGTON, MA 02474

Prop ID: 55.B-1-128
Prop Location: 993 MASS AVE UNIT 128 Arlington, MA
Owner: LAM VINCENT
Co-Owner: ZHAO YAN
Mailing Address:
993 MASS AVE UNIT 128
ARLINGTON, MA 02476

Prop ID: 55.B-1-201
Prop Location: 993 MASS AVE UNIT 201 Arlington, MA
Owner: BAGHDADI REZA
Co-Owner: SOLOUKI SAEIDEH
Mailing Address:
993 MASS AVE #201
ARLINGTON, MA 02476

Prop ID: 55.B-1-202
Prop Location: 993 MASS AVE UNIT 202 Arlington, MA
Owner: PARATORE JOSEPHINE
Co-Owner:
Mailing Address:
28 CROSS STREET
BELMONT, MA 02478

Prop ID: 55.B-1-203
Prop Location: 993 MASS AVE UNIT 203 Arlington, MA
Owner: DANALEVICH JENNIFER
Co-Owner:
Mailing Address:
1 CONN ST #3
WOBURN, MA 01801

Prop ID: 55.B-1-204
Prop Location: 993 MASS AVE UNIT 204 Arlington, MA
Owner: ILIC KATARINA
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 204
ARLINGTON, MA 02476

Prop ID: 55.B-1-205
Prop Location: 993 MASS AVE UNIT 205 Arlington, MA
Owner: GUO FEIFEI
Co-Owner:
Mailing Address:
993 MASS AVE #205
ARLINGTON, MA 02474

Prop ID: 55.B-1-206
Prop Location: 993 MASS AVE UNIT 206 Arlington, MA
Owner: KAHN ELIZABETH/ TRUSTEE
Co-Owner: BURKE REALTY TRUST
Mailing Address:
2424 EUCLID ST
SANTA MONICA, CA 90405

Prop ID: 55.B-1-207
Prop Location: 993 MASS AVE UNIT 207 Arlington, MA
Owner: ILIC KATARINA
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 204
ARLINGTON, MA 02476

Prop ID: 55.B-1-208
Prop Location: 993 MASS AVE UNIT 208 Arlington, MA
Owner: FLANIGAN ELAINE & JAMES/ TRS
Co-Owner: JAMES M FLANIGAN TRUST
Mailing Address:
190 BARLEY NECK ROAD
ORLEANS, MA 02653

Prop ID: 55.B-1-209
Prop Location: 993 MASS AVE UNIT 209 Arlington, MA
Owner: HORAN MATTHEW R
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 209
ARLINGTON, MA 02474

Prop ID: 55.B-1-210
Prop Location: 993 MASS AVE UNIT 210 Arlington, MA
Owner: DALLAS ANN F
Co-Owner:
Mailing Address:
993 MASS AVE #210
ARLINGTON, MA 02476

Prop ID: 55.B-1-211
Prop Location: 993 MASS AVE UNIT 211 Arlington, MA
Owner: DILEO HEIDI R RUTSTEIN
Co-Owner:
Mailing Address:
14 LOCKE STREET
WINCHESTER, MA 01890

Prop ID: 55.B-1-212
Prop Location: 993 MASS AVE UNIT 212 Arlington, MA
Owner: O`BRIEN MICHAEL
Co-Owner: SHEN QIANRU
Mailing Address:
993 MASS AVE UNIT 212
ARLINGTON, MA 02476

Prop ID: 55.B-1-213
Prop Location: 993 MASS AVE UNIT 213 Arlington, MA
Owner: CHEN QIAN
Co-Owner:
Mailing Address:
993 MASS AVENUE #213
ARLINGTON, MA 02476

Prop ID: 55.B-1-214
Prop Location: 993 MASS AVE UNIT 214 Arlington, MA
Owner: YOUNG WILLIAM F/TRUSTEE
Co-Owner: WILLIAM YOUNG JR TRUST
Mailing Address:
PO BOX 327 DEPT 16
HOUSTON, TX 77001

Prop ID: 55.B-1-215
Prop Location: 993 MASS AVE UNIT 215 Arlington, MA
Owner: KARAASLANIAN JACQUELINE
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 215
ARLINGTON, MA 02476

Prop ID: 55.B-1-216
Prop Location: 993 MASS AVE UNIT 216 Arlington, MA
Owner: PAUL DAVID S
Co-Owner:
Mailing Address:
993 MASS AVE #216
ARLINGTON, MA 02476

Prop ID: 55.B-1-217
Prop Location: 993 MASS AVE UNIT 217 Arlington, MA
Owner: HEALEY MARGARET L
Co-Owner:
Mailing Address:
993 MASS AVE
ARLINGTON, MA 02476

Prop ID: 55.B-1-218
Prop Location: 993 MASS AVE UNIT 218 Arlington, MA
Owner: PINE DANIEL R
Co-Owner:
Mailing Address:
51 STOWECROFT ROAD
ARLINGTON, MA 02476

Prop ID: 55.B-1-219
Prop Location: 993 MASS AVE UNIT 219 Arlington, MA
Owner: RASOGIANNI PANAGIOTA
Co-Owner:
Mailing Address:
993 MASS AVENUE #219
ARLINGTON, MA 02476

Prop ID: 55.B-1-220
Prop Location: 993 MASS AVE UNIT 220 Arlington, MA
Owner: BOWLER ELIZABETH M
Co-Owner:
Mailing Address:
993 MASS AVENUE #220
ARLINGTON, MA 02476

Prop ID: 55.B-1-221
Prop Location: 993 MASS AVE UNIT 221 Arlington, MA
Owner: GUTHRIE LINDA
Co-Owner:
Mailing Address:
993 MASS AVE #221
ARLINGTON, MA 02476

Prop ID: 55.B-1-222
Prop Location: 993 MASS AVE UNIT 222 Arlington, MA
Owner: BHANDARI MANISH
Co-Owner: BORAR SALONI
Mailing Address:
993 MASSACHUSETTS AVE
UNIT 222
ARLINGTON, MA 02476

Prop ID: 55.B-1-223
Prop Location: 993 MASS AVE UNIT 223 Arlington, MA
Owner: SIRACUSA JAMES M JR
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 223
ARLINGTON, MA 02476

Prop ID: 55.B-1-224
Prop Location: 993 MASS AVE UNIT 224 Arlington, MA
Owner: GOULD MARGARET M--ETAL
Co-Owner: GOULD PATRICK A
Mailing Address:
91-1511 KAIKOHOLA ST
EWA BEACH, HI 96706

Prop ID: 55.B-1-225
Prop Location: 993 MASS AVE UNIT 225 Arlington, MA
Owner: BURKE SARA
Co-Owner:
Mailing Address:
993 MASS AVE #225
ARLINGTON, MA 02476

Prop ID: 55.B-1-226
Prop Location: 993 MASS AVE UNIT 226 Arlington, MA
Owner: ORIA MYRA
Co-Owner:
Mailing Address:
993 MASS AVE #226
ARLINGTON, MA 02476

Prop ID: 55.B-1-227
Prop Location: 993 MASS AVE UNIT 227 Arlington, MA
Owner: ZHOU CHANGHAO
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE #227
ARLINGTON, MA 02476

Prop ID: 55.B-1-228
Prop Location: 993 MASS AVE UNIT 228 Arlington, MA
Owner: MARTIN ROBERT J & KATHRYN S/ TRS
Co-Owner: 993 MASSACHUSETTS AVENUE UNIT
Mailing Address:
993 MASS AVE UNIT 228
ARLINGTON, MA 02476

Prop ID: 55.B-1-301
Prop Location: 993 MASS AVE UNIT 301 Arlington, MA
Owner: MATTESON MARY BLISS
Co-Owner:
Mailing Address:
993 MASS AVE #301
ARLINGTON, MA 02476

Prop ID: 55.B-1-302
Prop Location: 993 MASS AVE UNIT 302 Arlington, MA
Owner: ZHU HUOHUI
Co-Owner: JI YANMIN
Mailing Address:
20 HAWTHORNE AVENUE
ARLINGTON, MA 02476

Prop ID: 55.B-1-303
Prop Location: 993 MASS AVE UNIT 303 Arlington, MA
Owner: NAJAFABADI MALIHE AHMADI
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 303
ARLINGTON, MA 02476

Prop ID: 55.B-1-304
Prop Location: 993 MASS AVE UNIT 304 Arlington, MA
Owner: MICKEVICH ANNA
Co-Owner:
Mailing Address:
993 MASS AVE #304
ARLINGTON, MA 02476

Prop ID: 55.B-1-305
Prop Location: 993 MASS AVE UNIT 305 Arlington, MA
Owner: BHATTACHAN JONU &
Co-Owner: TULACHAN ANUP
Mailing Address:
993 MASS AVE UNIT 305
ARLINGTON, MA 02474

Prop ID: 55.B-1-306
Prop Location: 993 MASS AVE UNIT 306 Arlington, MA
Owner: HARVEY THOMAS M
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 306
ARLINGTON, MA 02476

Prop ID: 55.B-1-307
Prop Location: 993 MASS AVE UNIT 307 Arlington, MA
Owner: AGHDAMLIAN ANTRANIK S/ TTE
Co-Owner: AGHDAMLIAN FAMILY TRUST
Mailing Address:
993 MASS AVENUE #307
ARLINGTON, MA 02476

Prop ID: 55.B-1-308
Prop Location: 993 MASS AVE UNIT 308 Arlington, MA
Owner: CHEAH JENYENG & SUSAN &
Co-Owner: LIANG WENKWAY
Mailing Address:
993 MASS AVENUE #308
ARLINGTON, MA 02476

Prop ID: 55.B-1-309
Prop Location: 993 MASS AVE UNIT 309 Arlington, MA
Owner: CHAN AMY
Co-Owner:
Mailing Address:
165 PHILIPS BROOKS RD
WESTWOOD, MA 02090

Prop ID: 55.B-1-310
Prop Location: 993 MASS AVE UNIT 310 Arlington, MA
Owner: SHEN GRACE/ LIFE ESTATE
Co-Owner:
Mailing Address:
59 SCITUATE ST
ARLINGTON, MA 02476

Prop ID: 55.B-1-311
Prop Location: 993 MASS AVE UNIT 311 Arlington, MA
Owner: RODRIGUEZ JACQUELINE F
Co-Owner:
Mailing Address:
993 MASS AVENUE #311
ARLINGTON, MA 02476

Prop ID: 55.B-1-312
Prop Location: 993 MASS AVE UNIT 312 Arlington, MA
Owner: CHAVES ANTONIO F & MARIA M
Co-Owner: TTEES/ CHAVES REVOCABLE TR
Mailing Address:
434 APPLETON STREET
ARLINGTON, MA 02476

Prop ID: 55.B-1-313
Prop Location: 993 MASS AVE UNIT 313 Arlington, MA
Owner: GARCIA FRANCISCO--ETAL
Co-Owner: GARCIA CORALIA M
Mailing Address:
5 COPPERSMITH WAY
LEXINGTON, MA 02476

Prop ID: 55.B-1-314
Prop Location: 993 MASS AVE UNIT 314 Arlington, MA
Owner: GUAN CHENGHE
Co-Owner: ZHANG JING
Mailing Address:
993 MASS AVE #314
ARLINGTON, MA 02476

Prop ID: 55.B-2-101
Prop Location: 995 MASS AVE UNIT 101 Arlington, MA
Owner: BARNES ANGELA/ETAL
Co-Owner: FITTANTE MICHAEL
Mailing Address:
5956 FAIRVIEW WOODS DR
FAIRFAX STATION, VA 22039

Prop ID: 55.B-2-102
Prop Location: 995 MASS AVE UNIT 102 Arlington, MA
Owner: GHELICHI RAMIN
Co-Owner: GHELICHI JESSICA JUNE
Mailing Address:
72 MT VERNON ST
ARLINGTON, MA 02476

Prop ID: 55.B-2-103
Prop Location: 995 MASS AVE UNIT 103 Arlington, MA
Owner: TEEHAN EDWARD R JR &
Co-Owner: TEEHAN MARGARET M
Mailing Address:
995 MASS AVENUE #103
ARLINGTON, MA 02476

Prop ID: 55.B-2-104
Prop Location: 995 MASS AVE UNIT 104 Arlington, MA
Owner: CORRICELLI DAVID
Co-Owner:
Mailing Address:
995 MASS AVENUE #104
ARLINGTON, MA 02476

Prop ID: 55.B-2-105
Prop Location: 995 MASS AVE UNIT 105 Arlington, MA
Owner: PASQUALE FRANCO
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 105
ARLINGTON, MA 02476

Prop ID: 55.B-2-106
Prop Location: 995 MASS AVE UNIT 106 Arlington, MA
Owner: LERNER DEVON A
Co-Owner:
Mailing Address:
48 FLORENCE AVENUE
UNIT 2
ARLINGTON, MA 02476

Prop ID: 55.B-2-201
Prop Location: 995 MASS AVE UNIT 201 Arlington, MA
Owner: ZAVARO GEORGE
Co-Owner: ZAVARO NAHREIN
Mailing Address:
60 BRIGHTON ST
BELMONT, MA 02478

Prop ID: 55.B-2-202
Prop Location: 995 MASS AVE UNIT 202 Arlington, MA
Owner: CHAN SAU KING
Co-Owner: LEUNG KENNETH G
Mailing Address:
12 RIDGE ST
WINCHESTER, MA 01890

Prop ID: 55.B-2-203
Prop Location: 995 MASS AVE UNIT 203 Arlington, MA
Owner: CHIVUKULA SRINIVAS & SUSMITHA
Co-Owner:
Mailing Address:
8 HERON CIR UNIT 8
WALPOLE, MA 02081

Prop ID: 55.B-2-204
Prop Location: 995 MASS AVE UNIT 204 Arlington, MA
Owner: MACDONALD SHARON
Co-Owner:
Mailing Address:
995 MASS AVENUE #204
ARLINGTON, MA 02476

Prop ID: 55.B-2-205
Prop Location: 995 MASS AVE UNIT 205 Arlington, MA
Owner: GALLAGHER JASON E
Co-Owner:
Mailing Address:
995 MASSACHUSETTS AVE
UNIT 205
ARLINGTON, MA 02476

Prop ID: 55.B-2-206
Prop Location: 995 MASS AVE UNIT 206 Arlington, MA
Owner: LAN TAO/CHEN KEXI
Co-Owner:
Mailing Address:
18 BROWNE ST
#2
BROOKLINE, MA 02446

Prop ID: 55.B-2-301
Prop Location: 995 MASS AVE UNIT 301 Arlington, MA
Owner: SU CLEMENT C
Co-Owner: WONG WENDY R
Mailing Address:
1 NASSAU ST
UNIT 1205
BOSTON, MA 02111

Prop ID: 55.B-2-302
Prop Location: 995 MASS AVE UNIT 302 Arlington, MA
Owner: SOUZA PEGGY A/ TRUSTEE
Co-Owner: BLAIR MICHAEL WARD SUPPLEMENTA
Mailing Address:
204 OSCEOLA RD
BELLEAIR, FL 33756

Prop ID: 55.B-2-303
Prop Location: 995 MASS AVE UNIT 303 Arlington, MA
Owner: MCCAULEY JAMES & BARBARA
Co-Owner:
Mailing Address:
1184 MASSACHUSETTS AVE
ARLINGTON, MA 02476

Prop ID: 55.B-2-304
Prop Location: 995 MASS AVE UNIT 304 Arlington, MA
Owner: CLEVELAND THOMAS /TRUSTEE
Co-Owner: SANDRA CLEVELAND TRUST
Mailing Address:
EDINBURG CENTER/SANDRA CLEVELAND
205 BURLINGTON RD
BEDFORD, MA 01730

Prop ID: 55.B-2-305
Prop Location: 995 MASS AVE UNIT 305 Arlington, MA
Owner: BIRD CHRISTINE W
Co-Owner:
Mailing Address:
995 MASS AVE #305
ARLINGTON, MA 02476

Prop ID: 55.B-2-306
Prop Location: 995 MASS AVE UNIT 306 Arlington, MA
Owner: LEUNG YUK KWAI/ TRUSTEE
Co-Owner: YUK KWAI LEUNG TRUST UDT
Mailing Address:
801 FRANKLIN ST #715
OAKLAND, CA 94607

Prop ID: 55.B-2-401
Prop Location: 995 MASS AVE UNIT 401 Arlington, MA
Owner: BLOOMQUIST ALAN
Co-Owner:
Mailing Address:
88 APPLETON STREET
QUINCY, MA 02171

Prop ID: 55.B-2-402
Prop Location: 995 MASS AVE UNIT 402 Arlington, MA
Owner: KREIFELDT ALEXANDER G
Co-Owner:
Mailing Address:
995 MASS AVE #402
ARLINGTON, MA 02476

Prop ID: 55.B-2-403
Prop Location: 995 MASS AVE UNIT 403 Arlington, MA
Owner: BARRETT JOHN A
Co-Owner:
Mailing Address:
995 MASS AVENUE #403
ARLINGTON, MA 02476

Prop ID: 55.B-2-404
Prop Location: 995 MASS AVE UNIT 404 Arlington, MA
Owner: SHINE GAETANA/MICHAEL
Co-Owner:
Mailing Address:
995 MASS AVE #404
ARLINGTON, MA 02476

Prop ID: 55.B-2-405
Prop Location: 995 MASS AVE UNIT 405 Arlington, MA
Owner: QUI GEPING
Co-Owner:
Mailing Address:
6 NASSAU DR
WINCHESTER, MA 01890

Prop ID: 55.B-2-406
Prop Location: 995 MASS AVE UNIT 406 Arlington, MA
Owner: BOYCE SUZANNE E
Co-Owner:
Mailing Address:
2700 ASHLAND AVE UNIT 21
CINCINNATI, OH 45206-1399

Prop ID: 55.B-2-501
Prop Location: 995 MASS AVE UNIT 501 Arlington, MA
Owner: GRUBEL JOANNA
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 501
ARLINGTON, MA 02474

Prop ID: 55.B-2-502
Prop Location: 995 MASS AVE UNIT 502 Arlington, MA
Owner: WEISS JOHN E & EMILY S
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 502
ARLINGTON, MA 02476

Prop ID: 55.B-2-503
Prop Location: 995 MASS AVE UNIT 503 Arlington, MA
Owner: ROPI ELAINE
Co-Owner:
Mailing Address:
995 MASS AVENUE #503
ARLINGTON, MA 02476

Prop ID: 55.B-2-504
Prop Location: 995 MASS AVE UNIT 504 Arlington, MA
Owner: CARLINO JANET
Co-Owner:
Mailing Address:
995 MASS AVENUE #504
ARLINGTON, MA 02476

Prop ID: 55.B-2-505
Prop Location: 995 MASS AVE UNIT 505 Arlington, MA
Owner: LIANG RUITING &
Co-Owner: QIAO JING
Mailing Address:
995 MASS AVE #505
ARLINGTON, MA 02476

Prop ID: 55.B-2-506
Prop Location: 995 MASS AVE UNIT 506 Arlington, MA
Owner: MASTROCOLA DAVID/TRUSTEE
Co-Owner: MARY KATHRYN MASTROCOLA 2016
Mailing Address:
995 MASS AVE UNIT #506
ARLINGTON, MA 02476

Attachment C
Photographic Log



NO. 1 / 10.7.2021 9:40 AM

DESCRIPTION

View of the existing fence and unstable slope at the southeastern end of the Project Site. Photo taken looking north from Mill Brook.



NO. 2 / 10.7.2021 9:51 AM

DESCRIPTION

View of the narrow pathway and existing vegetation north of Mill Brook. The Project Site's existing fence can be seen in the background of the photo. Photo taken looking west/southwest from Mill Brook.



NO. 3 / 10.7.2021 9:52 AM

DESCRIPTION

View of the existing fence and unstable slope located at the southeastern end of the Project Site. Photo taken looking north from Mill Brook.



NO. 4 / 10.7.2021 9:56 AM

DESCRIPTION

Portions of the Riverfront Area closest to Mill Brook are dominated by invasive species such as Japanese knotweed (*Fallopia japonica*).



NO. 5 / 10.18.2021 11:00 AM

DESCRIPTION

View of the entrance to the existing auto body shop located at the Project Site. Photo taken looking south from Dudley Street.



NO. 6 / 10.18.2021 11:01 AM

DESCRIPTION

View of the southern end of the Project Site. The steep slope leading towards Mill Brook is located just beyond the stockade fencing seen in the photo. Photo taken looking south on the Project Site.



NO. 7 / 10.18.2021 11:02 AM

DESCRIPTION

View of the southeastern end of the Project Site. The steep slope leading towards Mill Brook is located just beyond the stockade fencing seen in the photo. Photo taken looking southeast on the Project Site.



NO. 8 / 10.18.2021 11:02 AM

DESCRIPTION

View of the existing building located at the southeastern end of the Project Site. The steep slope leading towards Mill Brook is located just beyond the stockade fencing seen in the photo. Photo taken looking southeast on the Project Site.

Attachment D
Stormwater Management Report (Bound Separately)

Attachment E

Project Plans (Bound Separately)

Site Plans

Issued for	**Local Approvals**
Date Issued	**February 9, 2022**
Latest Issue	**February 9, 2022**

Proposed Self Storage Facility

34 Dudley Street
Arlington, Massachusetts



Owner

34 Dudley Street LLC
34 Dudley Street
Arlington, MA 02476

Applicant

PSI Atlantic Arlington MA, LLC
530 Oak Court Drive
Suite 155
Memphis, TN 38117

Assessor's Map: 55
Lot: 2-39.B

Sheet Index

No.	Drawing Title	Latest Issue
C1.01	Legend and General Notes	2/9/2022
C2.01	Site Preparation Plan	2/9/2022
C3.01	Layout and Materials Plan	2/9/2022
C4.01	Grading, Drainage, and Erosion Control Plan	2/9/2022
C5.01	Utility Plan	2/9/2022
C6.01-C6.03	Site Details	2/9/2022
L1.01	Planting Plan	2/9/2022
L2.01	Planting Details	2/9/2022

Reference Drawings

No.	Drawing Title	Latest Issue
Sv-1	Existing Conditions Plan of Land	11/5/2021
SL-1	Site Lighting Plan	2/9/2022
A-101 to A-106	Floor Plans	2/9/2022
A-201 to A-202	Exterior Elevations	2/9/2022

vhb.com

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

Architect:
Michael Parker Studios, PLLC
13755 Thompson Place Drive
Mint Hill, NC 28227
704.578.2851

Surveyor:
VHB
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Geotechnical:
GeoEngineers, Inc.
239 Causeway Street
Boston, MA 02114
617.749.9227



VHB Project : 52816.00 Arlington Self Storage
Issued for : Local Approvals 02/09/2022

\\VHBGBL\PRO\BEDFORD\52816.00 ARLINGTON SELF-STORAGE\C\CAD\LD\PLANSET\52816.00-COV 14 February 2022

Legend

Exist.	Prop.	
		PROPERTY LINE
		PROJECT LIMIT LINE
		RIGHT-OF-WAY/PROPERTY LINE
		EASEMENT
		BUILDING SETBACK
		PARKING SETBACK
10+00	10+00	BASELINE
		CONSTRUCTION LAYOUT
		ZONING LINE
		TOWN LINE
		LIMIT OF DISTURBANCE
		WETLAND LINE WITH FLAG
		FLOODPLAIN
BLSF	BLSF	BORDERING LAND SUBJECT TO FLOODING
BZ	BZ	WETLAND BUFFER ZONE
NDZ	NDZ	NO DISTURB ZONE
200'RA	200'RA	200' RIVERFRONT AREA
		GRAVEL ROAD
EOP	EOP	EDGE OF PAVEMENT
BB	BB	BITUMINOUS BERM
BC	BC	BITUMINOUS CURB
CC	CC	CONCRETE CURB
	CG	CURB AND GUTTER
CC	ECC	EXTRUDED CONCRETE CURB
CC	MCC	MONOLITHIC CONCRETE CURB
CC	PCC	PRECAST CONC. CURB
SGE	SGE	SLOPED GRAN. EDGING
VGC	VGC	VERT. GRAN. CURB
		LIMIT OF CURB TYPE
		SAWCUT
		BUILDING
	EN	BUILDING ENTRANCE
	LD	LOADING DOCK
		BOLLARD
D	D	DUMPSTER PAD
		SIGN
		DOUBLE SIGN
		STEEL GUARDRAIL
		WOOD GUARDRAIL
		PATH
		TREE LINE
		WIRE FENCE
		FENCE
		STOCKADE FENCE
		STONE WALL
		RETAINING WALL
		STREAM / POND / WATER COURSE
		DETENTION BASIN
		HAY BALES
		SILT FENCE
		SILT SOCK / STRAW WATTLE
4	4	MINOR CONTOUR
20	20	MAJOR CONTOUR
10	10	PARKING COUNT
	C10	COMPACT PARKING STALLS
DYL	DYL	DOUBLE YELLOW LINE
SL	SL	STOP LINE
		CROSSWALK
		ACCESSIBLE CURB RAMP
		ACCESSIBLE PARKING
VAN	VAN	VAN-ACCESSIBLE PARKING

Exist.	Prop.	
		CONCRETE
		HEAVY DUTY PAVEMENT
		BUILDINGS
		RIPRAP
		CONSTRUCTION EXIT
27.35 TC×	27.35 TC×	TOP OF CURB ELEVATION
26.85 BC×	26.85 BC×	BOTTOM OF CURB ELEVATION
132.75 ×	132.75 ×	SPOT ELEVATION
45.0 TW× 38.5 BW	45.0 TW× 38.5 BW	TOP & BOTTOM OF WALL ELEVATION
		BORING LOCATION
		TEST PIT LOCATION
MW	MW	MONITORING WELL
UD	UD	UNDERDRAIN
12"D	12"D	DRAIN
6"RD	6"RD	ROOF DRAIN
12"S	12"S	SEWER
FM	FM	FORCE MAIN
OHW	OHW	OVERHEAD WIRE
6"W	6"W	WATER
4"FP	4"FP	FIRE PROTECTION
	2"DW	DOMESTIC WATER
3"G	G	GAS
E	E	ELECTRIC
STM	STM	STEAM
T	T	TELEPHONE
FA	FA	FIRE ALARM
CATV	CATV	CABLE TV
		CATCH BASIN CONCENTRIC
		CATCH BASIN ECCENTRIC
		DOUBLE CATCH BASIN CONCENTRIC
		DOUBLE CATCH BASIN ECCENTRIC
		GUTTER INLET
		DRAIN MANHOLE CONCENTRIC
		DRAIN MANHOLE ECCENTRIC
TD		TRENCH DRAIN
E	E	PLUG OR CAP
CO	CO	CLEANOUT
		FLARED END SECTION
		HEADWALL
S		SEWER MANHOLE CONCENTRIC
S		SEWER MANHOLE ECCENTRIC
CS	CS	CURB STOP & BOX
WV	WV	WATER VALVE & BOX
TSV	TSV	TAPPING SLEEVE, VALVE & BOX
		FIRE DEPARTMENT CONNECTION
HYD	HYD	FIRE HYDRANT
WM	WM	WATER METER
PIV	PIV	POST INDICATOR VALVE
W	W	WATER WELL
GG	GG	GAS GATE
GM	GM	GAS METER
E	EMH	ELECTRIC MANHOLE
EM	EM	ELECTRIC METER
		LIGHT POLE
T	TMH	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
		UTILITY POLE
		GUY POLE
		GUY WIRE & ANCHOR
HH	HH	HAND HOLE
PB	PB	PULL BOX
		MATCHLINE

Abbreviations

General

ABAN	ABANDON
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
BIT	BITUMINOUS
BS	BOTTOM OF SLOPE
BWLL	BROKEN WHITE LANE LINE
CONC	CONCRETE
DYCL	DOUBLE YELLOW CENTER LINE
EL	ELEVATION
ELEV	ELEVATION
EX	EXISTING
FDN	FOUNDATION
FFE	FIRST FLOOR ELEVATION
GRAN	GRANITE
GTD	GRADE TO DRAIN
LA	LANDSCAPE AREA
LOD	LIMIT OF DISTURBANCE
MAX	MAXIMUM
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PERF	PERFORATED
PROP	PROPOSED
REM	REMOVE
RET	RETAIN
R&D	REMOVE AND DISPOSE
R&R	REMOVE AND RESET
SWEL	SOLID WHITE EDGE LINE
SWLL	SOLID WHITE LANE LINE
TS	TOP OF SLOPE
TYP	TYPICAL

Utility

CB	CATCH BASIN
CMP	CORRUGATED METAL PIPE
CO	CLEANOUT
DCB	DOUBLE CATCH BASIN
DMH	DRAIN MANHOLE
CIP	CAST IRON PIPE
COND	CONDUIT
DIP	DUCTILE IRON PIPE
FES	FLARED END SECTION
FM	FORCE MAIN
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
GI	GUTTER INLET
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HH	HANDHOLE
HW	HEADWALL
HYD	HYDRANT
INV	INVERT ELEVATION
I=	INVERT ELEVATION
LP	LIGHT POLE
MES	METAL END SECTION
PIV	POST INDICATOR VALVE
PWW	PAVED WATER WAY
PVC	POLYVINYLCHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
R=	RIM ELEVATION
RIM=	RIM ELEVATION
SMH	SEWER MANHOLE
TSV	TAPPING SLEEVE, VALVE AND BOX
UG	UNDERGROUND
UP	UTILITY POLE

Notes

General

1. CONTRACTOR SHALL NOTIFY "DIG-SAFE" (1-888-344-7233) AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
3. ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).
4. AREAS DISTURBED DURING CONSTRUCTION AND NOT RESTORED WITH IMPERVIOUS SURFACES (BUILDINGS, PAVEMENTS, WALKS, ETC.) SHALL RECEIVE 6" INCHES LOAM AND SEED.
5. WITHIN THE LIMITS OF THE BUILDING FOOTPRINT, THE SITE CONTRACTOR SHALL PERFORM EARTHWORK OPERATIONS REQUIRED UP TO SUBGRADE ELEVATIONS.
6. WORK WITHIN THE LOCAL RIGHTS-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHTS-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENTS STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.
7. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALKS, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
8. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
9. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
10. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
11. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
12. DAMAGE RESULTING FROM CONSTRUCTION LOADS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER.
13. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.

Utilities

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT AND CONTRACTOR'S FAILURE TO NOTIFY PRIOR TO PERFORMING ADDITIONAL WORK RELEASES OWNER FROM OBLIGATIONS FOR ADDITIONAL PAYMENTS WHICH OTHERWISE MAY BE WARRANTED TO RESOLVE THE CONFLICT.
3. SET CATCH BASIN RIMS, AND INVERTS OF SEWERS, DRAINS, AND DITCHES IN ACCORDANCE WITH ELEVATIONS ON THE GRADING AND UTILITY PLANS.
4. RIM ELEVATIONS FOR DRAIN AND SEWER MANHOLES, WATER VALVE COVERS, GAS GATES, ELECTRIC AND TELEPHONE PULL BOXES, AND MANHOLES, AND OTHER SUCH ITEMS, ARE APPROXIMATE AND SHALL BE SET/RESET AS FOLLOWS:
   A. PAVEMENTS AND CONCRETE SURFACES: FLUSH
   B. ALL SURFACES ALONG ACCESSIBLE ROUTES: FLUSH
   C. LANDSCAPE, LOAM AND SEED, AND OTHER EARTH SURFACE AREAS: ONE INCH ABOVE SURROUNDING AREA AND TAPER EARTH TO THE RIM ELEVATION.
5. THE LOCATION, SIZE, DEPTH, AND SPECIFICATIONS FOR CONSTRUCTION OF PROPOSED PRIVATE UTILITY SERVICES SHALL BE INSTALLED ACCORDING TO THE REQUIREMENTS PROVIDED BY, AND APPROVED BY, THE RESPECTIVE UTILITY COMPANY (GAS, TELEPHONE, ELECTRIC, FIRE ALARM, ETC.). FINAL DESIGN LOADS AND LOCATIONS TO BE COORDINATED WITH OWNER AND ARCHITECT.
6. CONTRACTOR SHALL MAKE ARRANGEMENTS FOR AND SHALL BE RESPONSIBLE FOR PAYING FEES FOR POLE RELOCATION AND FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, FIRE ALARM, AND ANY OTHER PRIVATE UTILITIES, WHETHER WORK IS PERFORMED BY CONTRACTOR OR BY THE UTILITIES COMPANY.
7. UTILITY PIPE MATERIALS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED ON THE PLAN:
   A. WATER PIPES SHALL BE CEMENT LINED DUCTILE IRON (DI) CLASS 52.
   B. SANITARY SEWER PIPES SHALL BE POLYVINYL CHLORIDE (PVC) SEWER PIPE, SDR-35
   C. STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HDPE).
   D. PIPE INSTALLATION AND MATERIALS SHALL COMPLY WITH THE STATE PLUMBING CODE WHERE APPLICABLE. CONTRACTOR SHALL COORDINATE WITH LOCAL PLUMBING INSPECTOR PRIOR TO BEGINNING WORK.
8. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR AND SHALL FURNISH EXCAVATION, INSTALLATION, AND BACKFILL OF ELECTRICAL FURNISHED SITEWORK RELATED ITEMS SUCH AS PULL BOXES, CONDUITS, DUCT BANKS, LIGHT POLE BASES, AND CONCRETE PADS. SITE CONTRACTOR SHALL FURNISH CONCRETE ENCASEMENT OF DUCT BANKS IF REQUIRED BY THE UTILITY COMPANY AND AS INDICATED ON THE DRAWINGS.
9. CONTRACTOR SHALL EXCAVATE AND BACKFILL TRENCHES FOR GAS IN ACCORDANCE WITH GAS COMPANY'S REQUIREMENTS.
10. ALL DRAINAGE AND SANITARY STRUCTURE INTERIOR DIAMETERS (4' MIN.) SHALL BE DETERMINED BY THE MANUFACTURER BASED ON THE PIPE CONFIGURATIONS SHOWN ON THESE PLANS AND LOCAL MUNICIPAL STANDARDS. FOR MANHOLES THAT ARE 20 FEET IN DEPTH AND GREATER, THE MINIMUM DIAMETER SHALL BE 5 FEET.

Layout and Materials

1. DIMENSIONS ARE FROM THE FACE OF CURB, FACE OF BUILDING, FACE OF WALL, AND CENTER LINE OF PAVEMENT MARKINGS, UNLESS OTHERWISE NOTED.
2. CURB RADII ARE 3 FEET UNLESS OTHERWISE NOTED.
3. CURBING SHALL BE PRECAST CONCRETE CURB (PCC) WITHIN THE SITE UNLESS OTHERWISE INDICATED ON THE PLANS.
4. SEE ARCHITECTURAL DRAWINGS FOR EXACT BUILDING DIMENSIONS AND DETAILS CONTIGUOUS TO THE BUILDING, INCLUDING SIDEWALKS, RAMPS, BUILDING ENTRANCES, STAIRWAYS, UTILITY PENETRATIONS, CONCRETE DOOR PADS, COMPACTOR PAD, LOADING DOCKS, BOLLARDS, ETC.
5. PROPOSED BOUNDS AND ANY EXISTING PROPERTY LINE MONUMENTATION DISTURBED DURING CONSTRUCTION SHALL BE SET OR RESET BY A PROFESSIONAL LAND SURVEYOR.
6. PRIOR TO START OF CONSTRUCTION, CONTRACTOR SHALL VERIFY EXISTING PAVEMENT ELEVATIONS AT INTERFACE WITH PROPOSED PAVEMENTS, AND EXISTING GROUND ELEVATIONS ADJACENT TO DRAINAGE OUTLETS TO ASSURE PROPER TRANSITIONS BETWEEN EXISTING AND PROPOSED FACILITIES.

Demolition

1. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS AND UNSUITABLE MATERIAL BENEATH AND FOR A DISTANCE OF 10 FEET BEYOND THE PROPOSED BUILDING FOOTPRINT INCLUDING EXTERIOR COLUMNS.
2. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
3. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
4 THE DEMOLITION LIMITS DEPICTED IN THE PLANS IS INTENDED TO AID THE CONTRACTOR DURING THE BIDDING AND CONSTRUCTION PROCESS AND IS NOT INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
5. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH. MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS.

Erosion Control

1. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
2. CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS (MINIMUM) OR AS REQUIRED PER THE ORDER OF CONDITIONS. THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS.
3. CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
4. CONTRACTOR SHALL PERFORM CONSTRUCTION SEQUENCING SUCH THAT EARTH MATERIALS ARE EXPOSED FOR A MINIMUM OF TIME BEFORE THEY ARE COVERED, SEEDED, OR OTHERWISE STABILIZED TO PREVENT EROSION.
5. UPON COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER, CONTRACTOR SHALL REMOVE AND DISPOSE OF EROSION CONTROL MEASURES AND CLEAN SEDIMENT AND DEBRIS FROM ENTIRE DRAINAGE AND SEWER SYSTEMS.

Existing Conditions Information

1. BASE PLAN: THE PROPERTY LINES SHOWN ON THE LAYOUT AND MATERIALS PLAN WERE DETERMINED BY AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN OCTOBER, 2021, AND FROM DEEDS AND PLANS OF RECORD. THE TOPOGRAPHY AND PHYSICAL FEATURES ARE BASED ON AN ACTUAL FIELD SURVEY PERFORMED ON THE GROUND BY VHB, INC., DURING OCTOBER, 2021.
   A. DELINEATION OF THE WETLANDS AND PLACEMENT OF THE FLAGS WAS PERFORMED BY: VHB ENVIRONMENTAL DEPARTMENT IN OCTOBER, 2021.
   B. FLAGS MARKING THE WETLANDS WERE LOCATED BY: VHB, BY FIELD SURVEY IN OCTOBER, 2021
2. TOPOGRAPHY: ELEVATIONS ARE BASED ON NAVD OF 1988.
3. GEOTECHNICAL DATA INCLUDING TEST PIT AND BORING LOCATIONS AND ELEVATIONS WERE OBTAINED FROM GEOENGINEERS USA, PC DATED JANUARY 28, 2022.

Document Use

1. THESE PLANS AND CORRESPONDING CADD DOCUMENTS ARE INSTRUMENTS OF PROFESSIONAL SERVICE, AND SHALL NOT BE USED, IN WHOLE OR IN PART, FOR ANY PURPOSE OTHER THAN FOR WHICH IT WAS CREATED WITHOUT THE EXPRESSED, WRITTEN CONSENT OF VHB. ANY UNAUTHORIZED USE, REUSE, MODIFICATION OR ALTERATION, INCLUDING AUTOMATED CONVERSION OF THIS DOCUMENT SHALL BE AT THE USER'S SOLE RISK WITHOUT LIABILITY OR LEGAL EXPOSURE TO VHB.
2. CONTRACTOR SHALL NOT RELY SOLELY ON ELECTRONIC VERSIONS OF PLANS, SPECIFICATIONS, AND DATA FILES THAT ARE OBTAINED FROM THE DESIGNERS, BUT SHALL VERIFY LOCATION OF PROJECT FEATURES IN ACCORDANCE WITH THE PAPER COPIES OF THE PLANS AND SPECIFICATIONS THAT ARE SUPPLIED AS PART OF THE CONTRACT DOCUMENTS.
3. SYMBOLS AND LEGENDS OF PROJECT FEATURES ARE GRAPHIC REPRESENTATIONS AND ARE NOT NECESSARILY SCALED TO THEIR ACTUAL DIMENSIONS OR LOCATIONS ON THE DRAWINGS. THE CONTRACTOR SHALL REFER TO THE DETAIL SHEET DIMENSIONS, MANUFACTURERS' LITERATURE, SHOP DRAWINGS AND FIELD MEASUREMENTS OF SUPPLIED PRODUCTS FOR LAYOUT OF THE PROJECT FEATURES.

vhb.com

vhb

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by MEA | Checked by EKG

Issued for: Local Approvals | Date: February 9, 2022

Not Approved for Construction

Drawing Title: Legend and General Notes

Drawing Number: C1.01

Sheet 1 of 10

Project Number: 52816.00

COMMONWEALTH OF MASSACHUSETTS
ERIC K. GERADE
CIVIL
NO. 47000
REGISTERED PROFESSIONAL ENGINEER
2/9/2022

Saved Wednesday, February 9, 2022 6:29:05 PM MADAMS Plotted Monday, February 14, 2022 1:13:29 PM Eric Gerade

Document Use:

THIS BASE PLAN ILLUSTRATES THE MINIMUM PERIMETER EROSION & SEDIMENTATION CONTROLS. THE CONTRACTOR SHALL UPDATE THIS PLAN THROUGHOUT THE DURATION OF CONSTRUCTION TO SHOW THE LOCATIONS OF PROPOSED/CONSTRUCTED E&S CONTROLS DEEMED NECESSARY TO MEET THE REQUIREMENTS OF THE ORDER OF CONDITIONS.

PROJECT E&S NARRATIVE:
THE PROPOSED PROJECT CONSISTS OF A 95,700± SQUARE-FOOT SELF STORAGE FACILITY WITH ANCILLARY LANDSCAPE IMPROVEMENTS, PARKING SPACES, AND UTILITY IMPROVEMENTS TO SUPPORT THIS USE. THE APPROXIMATELY 0.78 ACRE SITE WILL BE DEVELOPED AS A SINGLE-PHASE PROJECT.

EROSION AND SEDIMENTATION CONTROL TECHNIQUES
THE EROSION AND SEDIMENTATION CONTROLS SHOWN HEREON ARE PERIMETER MEASURES ONLY. THE CONTRACTOR IS REQUIRED TO PROVIDE ADDITIONAL INTERIM EROSION AND SEDIMENTATION CONTROLS, INCLUDING BUT NOT LIMITED TO THOSE LISTED BELOW. THE CONTRACTOR SHALL MANAGE EROSION AND SEDIMENTATION DURING CONSTRUCTION TO PREVENT IMPACTS TO RESOURCE AREAS, ROADWAYS, AND ABUTTING PROPERTIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE EROSION AND SEDIMENTATION CONTROLS THROUGHOUT THE DURATION OF CONSTRUCTION.

CATCH BASIN PROTECTION
NEWLY CONSTRUCTED AND EXISTING CATCH BASINS WILL BE PROTECTED WITH SILT SACKS THROUGHOUT CONSTRUCTION.

GRAVEL AND CONSTRUCTION ENTRANCE/EXIT
A TEMPORARY CRUSHED-STONE CONSTRUCTION ENTRANCE/EXIT WILL BE CONSTRUCTED. A CROSS SLOPE WILL BE PLACED IN THE ENTRANCE TO DIRECT RUNOFF TO THE SEDIMENT TRAP.

VEGETATIVE SLOPE STABILIZATION
STABILIZATION OF OPEN SOIL SURFACES WILL BE IMPLEMENTED WITHIN 14 DAYS AFTER GRADING OR CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED, UNLESS THERE IS SUFFICIENT SNOW COVER TO PROHIBIT IMPLEMENTATION. VEGETATIVE SLOPE STABILIZATION WILL BE USED TO MINIMIZE EROSION ON SLOPES OF 3:1 OR FLATTER. ANNUAL GRASSES, SUCH AS ANNUAL RYE, WILL BE USED TO ENSURE RAPID GERMINATION AND PRODUCTION OF ROOTMASS. PERMANENT STABILIZATION WILL BE COMPLETED WITH THE PLANTING OF PERENNIAL GRASSES OR LEGUMES. ESTABLISHMENT OF TEMPORARY AND PERMANENT VEGETATIVE COVER MAY BE ESTABLISHED BY HYDRO-SEEDING OR SODDING. A SUITABLE TOPSOIL, GOOD SEEDBED PREPARATION, AND ADEQUATE LIME, FERTILIZER AND WATER WILL BE PROVIDED FOR EFFECTIVE ESTABLISHMENT OF THESE VEGETATIVE STABILIZATION METHODS. MULCH WILL ALSO BE USED AFTER PERMANENT SEEDING TO PROTECT SOIL FROM THE IMPACT OF FALLING RAIN AND TO INCREASE THE CAPACITY OF THE SOIL TO ABSORB WATER.

TEMPORARY SEDIMENT BASINS
TEMPORARY SEDIMENT BASINS WILL BE DESIGNED EITHER AS EXCAVATIONS OR BERMED STORMWATER DETENTION STRUCTURES (DEPENDING ON GRADING) THAT WILL RETAIN RUNOFF FOR A SUFFICIENT PERIOD OF TIME TO ALLOW SUSPENDED SOIL PARTICLES TO SETTLE OUT PRIOR TO DISCHARGE. THESE TEMPORARY BASINS WILL BE LOCATED BASED ON CONSTRUCTION NEEDS AS DETERMINED BY THE CONTRACTOR AND OUTLET DEVICES WILL BE DESIGNED TO CONTROL VELOCITY AND SEDIMENT. POINTS OF DISCHARGE FROM SEDIMENT BASINS WILL BE STABILIZED TO MINIMIZE EROSION. AT A MINIMUM, SEDIMENTATION BASINS SHALL BE DESIGNED AND CONSTRUCTED TO PROVIDE STORAGE FOR THE VOLUME OF RUNOFF GENERATED FROM A 2-YR, 24-HR DESIGN STORM, OR AT LEAST 3,600 CUBIC FEET OF STORAGE PER ACRE DRAINING TO THE BASIN.

STOCKPILE MANAGEMENT
SIDESLOPES OF STOCKPILED MATERIAL SHALL BE NO STEEPER THAN 2:1. STOCKPILES NOT USED WITHIN 30 DAYS NEED TO BE SEEDED AND MULCHED IMMEDIATELY AFTER FORMATION OF THE STOCKPILE. STRAW BALES AND SILT FENCE ARE TO BE PLACED AROUND THE STOCKPILE AREA APPROXIMATELY 10 FEET FROM THE TOE OF SLOPE.

DUST CONTROL
PERIODICALLY MOISTEN EXPOSED SURFACES ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAY DAMP AND REDUCE DUST.

TEMPORARY EROSION AND SEDIMENTATION CONTROL MAINTENANCE (THROUGHOUT CONSTRUCTION)

THE SITE CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS (MINIMUM) OR AS REQUIRED PER ORDER OF CONDITIONS. THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS. RECORDS OF THE INSPECTIONS WILL BE PREPARED AND MAINTAINED ON-SITE BY THE CONTRACTOR.

SILT SHALL BE REMOVED FROM BEHIND BARRIERS IF GREATER THAN 6-INCHES DEEP OR AS NEEDED.

DAMAGED OR DETERIORATED ITEMS WILL BE REPAIRED IMMEDIATELY AFTER IDENTIFICATION.

SEDIMENT THAT IS COLLECTED IN STRUCTURES SHALL BE DISPOSED OF PROPERLY AND COVERED IF STORED ON-SITE.

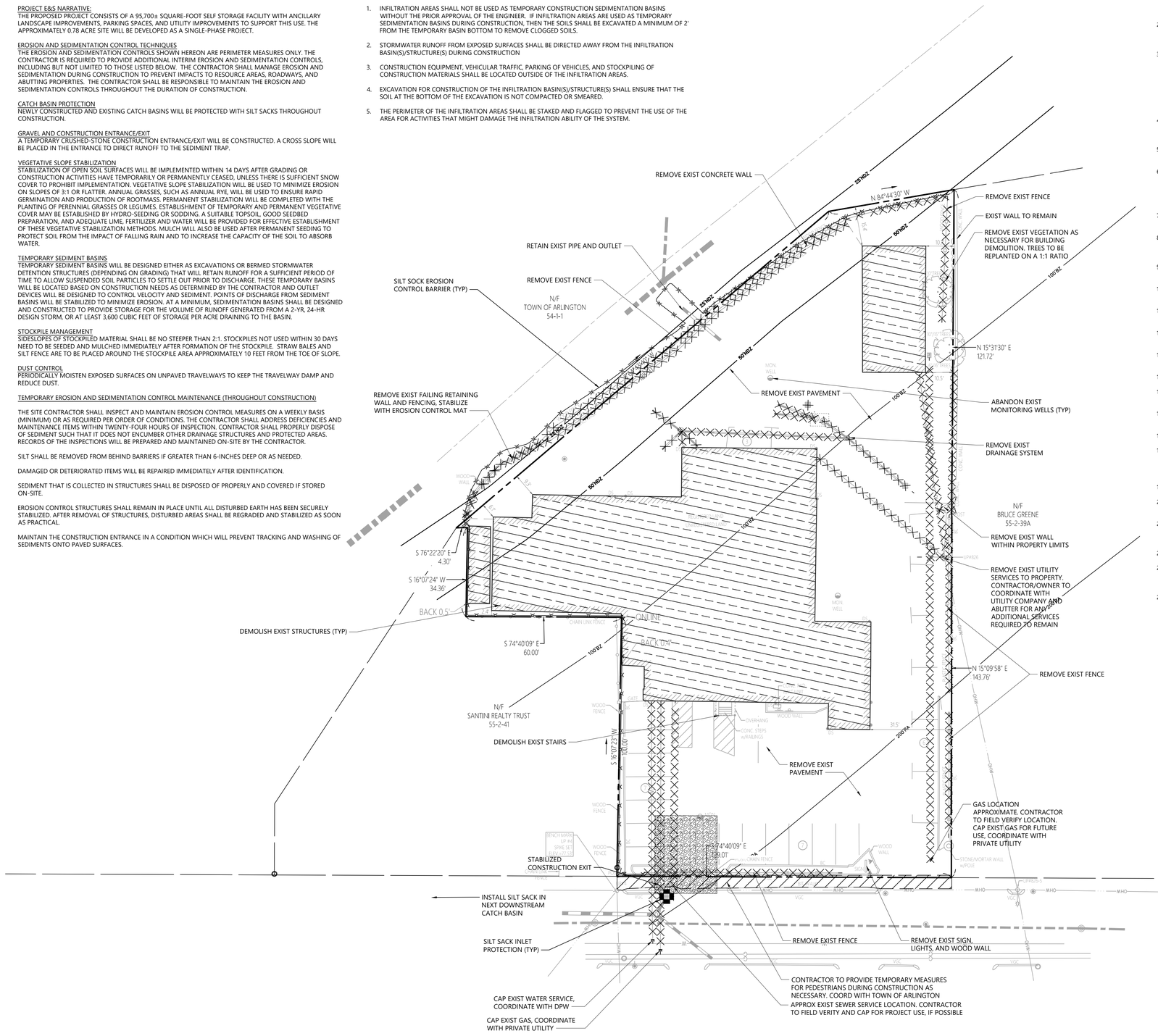
EROSION CONTROL STRUCTURES SHALL REMAIN IN PLACE UNTIL ALL DISTURBED EARTH HAS BEEN SECURELY STABILIZED. AFTER REMOVAL OF STRUCTURES, DISTURBED AREAS SHALL BE REGRADED AND STABILIZED AS SOON AS PRACTICAL.

MAINTAIN THE CONSTRUCTION ENTRANCE IN A CONDITION WHICH WILL PREVENT TRACKING AND WASHING OF SEDIMENTS ONTO PAVED SURFACES.

INFILTRATION AREA PROTECTION DURING CONSTRUCTION

FOR THE LONG-TERM FUNCTION OF THE INFILTRATION BASIN(S)/STRUCTURE(S), CARE SHALL BE TAKEN IN THE INFILTRATION AREAS DURING CONSTRUCTION THE CONSTRACTOR SHALL EMPLOY THE FOLLOWING MINIMUM BEST MANAGEMENT PRACTICES (BMPS):

1. INFILTRATION AREAS SHALL NOT BE USED AS TEMPORARY CONSTRUCTION SEDIMENTATION BASINS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER. IF INFILTRATION AREAS ARE USED AS TEMPORARY SEDIMENTATION BASINS DURING CONSTRUCTION, THEN THE SOILS SHALL BE EXCAVATED A MINIMUM OF 2' FROM THE TEMPORARY BASIN BOTTOM TO REMOVE CLOGGED SOILS.
2. STORMWATER RUNOFF FROM EXPOSED SURFACES SHALL BE DIRECTED AWAY FROM THE INFILTRATION BASIN(S)/STRUCTURE(S) DURING CONSTRUCTION
3. CONSTRUCTION EQUIPMENT, VEHICULAR TRAFFIC, PARKING OF VEHICLES, AND STOCKPILING OF CONSTRUCTION MATERIALS SHALL BE LOCATED OUTSIDE OF THE INFILTRATION AREAS.
4. EXCAVATION FOR CONSTRUCTION OF THE INFILTRATION BASIN(S)/STRUCTURE(S) SHALL ENSURE THAT THE SOIL AT THE BOTTOM OF THE EXCAVATION IS NOT COMPACTED OR SMEARED.
5. THE PERIMETER OF THE INFILTRATION AREAS SHALL BE STAKED AND FLAGGED TO PREVENT THE USE OF THE AREA FOR ACTIVITIES THAT MIGHT DAMAGE THE INFILTRATION ABILITY OF THE SYSTEM.



Site Preparation Notes:

1. UNLESS OTHERWISE SPECIFICALLY PROVIDED ON THE PLANS OR IN THE SPECIFICATIONS, THE ENGINEER HAS NOT PREPARED DESIGNS FOR AND SHALL HAVE NO RESPONSIBILITY FOR THE PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF HAZARDOUS MATERIALS, TOXIC WASTES OR POLLUTANTS AT THE PROJECT SITE. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY CLAIMS OF LOSS, DAMAGE, EXPENSE, DELAY, INJURY OR DEATH ARISING FROM THE PRESENCE OF HAZARDOUS MATERIAL AND CONTRACTOR SHALL INDEMNIFY AND HOLD HARMLESS THE ENGINEER FROM ANY CLAIMS MADE IN CONNECTION THEREWITH. MOREOVER, THE ENGINEER SHALL HAVE NO ADMINISTRATIVE OBLIGATIONS OF ANY TYPE WITH REGARD TO ANY CONTRACTOR AMENDMENT INVOLVING THE ISSUES OF PRESENCE, DISCOVERY, REMOVAL, ABATEMENT OR DISPOSAL OF ASBESTOS OR OTHER HAZARDOUS MATERIALS
2. CONTRACTOR SHALL REMOVE AND DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMIT OF DEMOLITION INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
3. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR IT'S REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES AND, SHALL CONFIRM THAT THERE ARE NO INTERFERENCES WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY.
4. EXISTING UTILITIES SHALL BE TERMINATED, UNLESS OTHERWISE NOTED, IN CONFORMANCE WITH LOCAL, STATE AND INDIVIDUAL UTILITY COMPANY STANDARD SPECIFICATIONS AND DETAILS. THE CONTRACTOR SHALL COORDINATE UTILITY SERVICE DISCONNECTS WITH THE UTILITY REPRESENTATIVES.
5. CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS, ORDINANCES AND STATUTES.
6. THE DEMOLITION LIMITS DEPICTED IS INTENDED TO AID THE CONTRACTOR DURING THE BIDDING AND CONSTRUCTION PROCESS AND IS NOT INTENDED TO DEPICT EACH AND EVERY ELEMENT OF DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING THE DETAILED SCOPE OF DEMOLITION BEFORE SUBMITTING ITS BID/PROPOSAL TO PERFORM THE WORK AND SHALL MAKE NO CLAIMS AND SEEK NO ADDITIONAL COMPENSATION FOR CHANGED CONDITIONS OR UNFORESEEN OR LATENT SITE CONDITIONS RELATED TO ANY CONDITIONS DISCOVERED DURING EXECUTION OF THE WORK.
7. EXISTING UTILITIES AND FEATURES TO REMAIN SHALL BE MAINTAINED AND PROTECTED AGAINST DAMAGE DURING DEMOLITION OPERATIONS.
8. EXISTING UTILITY LINES NOT SPECIFICALLY NOTED OR SHOWN WHICH ARE ENCOUNTERED DURING CONSTRUCTION SHALL BE CAPPED, EXTENDED, PROTECTED, REMOVED, OR REWORKED AS DIRECTED OR REQUIRED BY THE OWNER OR THE TOWN OF ARLINGTON.
9. CM/CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL NECESSARY PERMITS FROM LOCAL AND STATE AUTHORITIES TO COMPLETE THE WORK.
10. CM/CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE AND FEDERAL SAFETY REGULATIONS TO PROTECT THE PUBLIC WHILE DEMOLITION WORK IS BEING PERFORMED.
11. FURNISH, ERECT AND MAINTAIN ALL TEMPORARY BARRICADES, FENCES, COVERINGS, ENCLOSURES, SIGNS AND LIGHTING AS MAY BE REQUIRED TO CARRY ON DEMOLITION WORK IN A SAFE AND LEGAL MANNER.
12. CATCH BASINS WITHIN THE LIMIT OF WORK AND IN THE IMMEDIATE VICINITY OF THE LIMIT OF WORK SHALL BE FITTED WITH SEDIMENTATION TRAPS UNTIL THE SITE IS PERMANENTLY STABILIZED.
13. CM/CONTRACTOR SHALL BE FULLY RESPONSIBLE TO CONTROL CONSTRUCTION SUCH THAT SEDIMENTATION SHALL NOT AFFECT REGULATORY PROTECTED AREAS, WHETHER SUCH SEDIMENTATION IS CAUSED BY WATER, WIND, OR DIRECT DEPOSIT.
14. DO NOT USE EXPLOSIVES FOR BUILDING DEMOLITION.
15. DUST CONTROL TREATMENTS SHALL BE APPLIED AS NECESSARY TO CONTROL AND REDUCE THE AMOUNT OF DUST WHICH MAY CAUSE OFF SITE DAMAGE, BE A HEALTH HAZARD TO HUMANS, WILDLIFE AND PLANT LIFE, OR POSE A HAZARD TO TRAFFIC SAFETY.
16. ADJOINING STREETS AND PROPERTIES SHALL BE KEPT FREE OF DEBRIS RESULTING FROM THE DEMOLITION AND SHALL BE BROOM CLEANED ON A DAILY BASIS.
17. HOURS OF OPERATION TO BE AS PER LOCAL ORDINANCE. CM/CONTRACTOR TO VERIFY PRIOR TO STARTING ON SITE OPERATIONS.
18. WHERE CONNECTIONS TO EXISTING UTILITIES ARE PROPOSED, THE CM/CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF THE EXISTING UTILITY AT THE CONNECTION POINT PRIOR TO ORDERING MATERIALS OR DEMOLISHING ANY UNUSED PORTIONS OF THE UTILITY AS SPECIFICALLY CALLED OUT ON THIS PLAN. DISCREPANCIES WITH THE EXISTING CONDITIONS INFORMATION SHOWN SHALL BE REPORTED TO THE ENGINEER FOR DIRECTION.
19. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING SITE ACCESS AND SITE SECURITY AT ALL TIMES DURING CONSTRUCTION.
20. ALL EXISTING TREES WITHIN THE LIMIT OF DEMOLITION SHALL BE REMOVED AND DISPOSED OF OFF SITE AT A SAFE, APPROVED LOCATION UNLESS OTHERWISE NOTED.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING CONSTRUCTION EXITS AT ALL CONSTRUCTION VEHICLE ACCESS POINTS ONTO DISTURBED AREAS OF THE SITE. CONSTRUCTION EXITS SHALL BE MAINTAINED UNTIL DISTURBED PORTIONS OF THE SITE ARE STABILIZED AS DETERMINED BY THE ENGINEER
22. CONTRACTOR MUST MAINTAIN ALL EXISTING SERVICES TO THE ABUTTING PROPERTY.
23. PRIOR TO STARTING ANY OTHER WORK ON THE SITE, THE CONTRACTOR SHALL NOTIFY APPROPRIATE AGENCIES AND SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE PLANS AND AS IDENTIFIED IN FEDERAL, STATE, AND LOCAL APPROVAL DOCUMENTS PERTAINING TO THIS PROJECT.
24. THE SITE CONTRACTOR SHALL INSPECT AND MAINTAIN EROSION CONTROL MEASURES ON A WEEKLY BASIS (MINIMUM) OR AS REQUIRED PER THE TOWN OF ARLINGTON CONSERVATION COMMISSION ORDER OF CONDITIONS. THE CONTRACTOR SHALL ADDRESS DEFICIENCIES AND MAINTENANCE ITEMS WITHIN TWENTY-FOUR HOURS OF INSPECTION. CONTRACTOR SHALL PROPERLY DISPOSE OF SEDIMENT SUCH THAT IT DOES NOT ENCUMBER OTHER DRAINAGE STRUCTURES AND PROTECTED AREAS. RECORDS OF THE INSPECTIONS WILL BE PREPARED AND MAINTAINED ON-SITE BY THE CONTRACTOR.

vhb.com
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

LEGEND

- XXXXX – TO BE REMOVED
- ////////- UTILITIES TO BE ABANDONED IN PLACE
- CONCRETE TO BE REMOVED
- STRUCTURE TO BE REMOVED

0 10 20 40 Feet

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by SJH | Checked by EKG

Issued for: Local Approvals — Date: February 9, 2022

Not Approved for Construction

Drawing Title: Site Preparation Plan

Drawing Number: C2.01

Sheet 2 of 10

Project Number: 52816.00

COMMONWEALTH OF MASSACHUSETTS ERIC K. GERADE CIVIL 47000 REGISTERED PROFESSIONAL ENGINEER 2/7/2022

Saved Friday, February 11, 2022 3:56:06 PM EGERADE Plotted Monday, February 14, 2022 11:14:18 PM Eric Gerade

Zoning Summary Chart

Zoning District:	Industrial (I)
Overlay District:	Inland Wetland District

Zoning Regulation Requirements	Required*	Provided
MAXIMUM FRONT YARD SETBACK	10 Feet	10.0 Feet
MINIMUM FRONT YARD SETBACK	10 Feet	10.0 Feet
SIDE YARD SETBACK	10 Feet	10.0 Feet
REAR YARD SETBACK	10 Feet	12.5 Feet
MAXIMUM FLOOR AREA RATIO	3.0	2.81
MAXIMUM BUILDING HEIGHT	5 Stories	58 Feet, 5 Stories **

* Zoning regulation requirements as specified in the Town of Arlington Zoning Bylaw, Amended on April 26, 2021, Section 5.6.2

** 58' Top of Parapet, 54' 10" to top of roof

Inland Wetland District Performance Standards

	Existing	Proposed	Improvement
IMPERVIOUS AREA (50' SETBACK)	3790 SF	1461 SF	2329 SF (61.5%)
IMPERVIOUS SETBACK	25.9 Feet	34.1 Feet	+8.2 Feet

Sign Summary

M.U.T.C.D. Number	Specification Width	Height	Desc.
R1-1	30"	30"	STOP
R7-8	12"	18"	RESERVED PARKING
R7-8P	12"	6"	VAN ACCESSIBLE
SP-1	12"	18"	RESERVED FOR CARPOOL PARKING

Building Sign Summary

ID Number	Sign Type	Specification Width	Height	Area	Desc.
1	Wall Sign	288"	90"	180 SF	CUBESMART Self Storage
2	Wall Sign	288"	90"	180 SF	CUBESMART Self Storage
3	Wall Sign	29.25"	6"	1.22 SF	OFFICE
4	Wall Sign	52"	11"	3.97 SF	LOADING
5	Freestanding Sign	78"	44"	23.8 SF	CUBESMART Self Storage

NOTE:

1. SIGNS FROM SIGN PACKAGE PREPARED BY ELRO SIGNS FOR CUBESMART SELF STORAGE, 34 DUDLEY STREET, ARLINGTON, MA, DATED JANUARY 10, 2022. REFER TO SIGN PACKAGE FOR SIGN DETAILS AND RENDERINGS.

Parking Summary Chart

Description	Size Required	Size Provided	Spaces Required	Spaces Provided
STANDARD SPACES	8.5 x 18	8.5 x 18	96	7
PARALLEL SPACES	8 x 22	8 x 22	0	3
ACCESSIBLE SPACES*	8 x 18	8.5 x 18	-	1
TOTAL SPACES			96	11
LOADING BAYS**			3	4
BICYCLE SPACES***			134	11

* ADA/STATE/LOCAL REQUIREMENTS. (1 ACCESSIBLE SPACE PER 1-25 TOTAL PARKING SPACES) PER § 208.2 OF 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN

** LOADING BAYS: THREE BAYS FOR BETWEEN 40,001 SF AND 120,000 SF

*** BICYCLE PARKING REQUIRED BASED ON 0.8/1,000 SF LONG TERM AND 0.6/1,000 SF SHORT TERM PARKING. 4 BICYCLE SPACES ARE PROVIDED BY TWO RACKS UNDER THE BUILDING OVERHANG. 6 BICYCLE SPACES ARE PROVIDED WITHIN THE COVERED LOADING AREA. EMPLOYEE BICYCLE STORAGE WILL BE PROVIDED WITHIN A TENANT STORAGE UNIT THE BUILDING (1 SPACE MINIMUM).

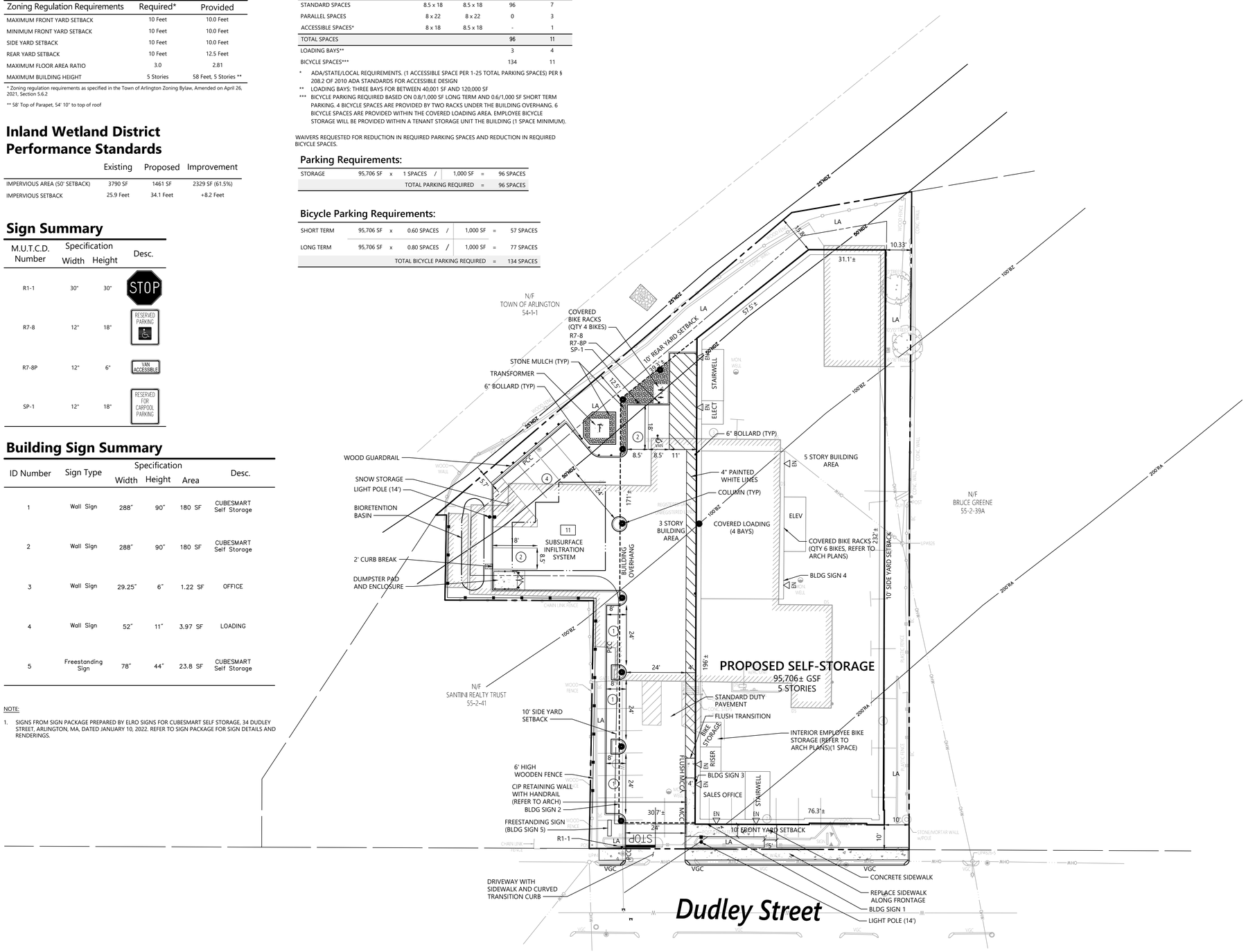
WAIVERS REQUESTED FOR REDUCTION IN REQUIRED PARKING SPACES AND REDUCTION IN REQUIRED BICYCLE SPACES.

Parking Requirements:

STORAGE	95,706 SF	x	1 SPACES	/	1,000 SF	= 96 SPACES
			TOTAL PARKING REQUIRED			= 96 SPACES

Bicycle Parking Requirements:

SHORT TERM	95,706 SF	x	0.60 SPACES	/	1,000 SF	= 57 SPACES
LONG TERM	95,706 SF	x	0.80 SPACES	/	1,000 SF	= 77 SPACES
			TOTAL BICYCLE PARKING REQUIRED			= 134 SPACES



vhb.com

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

0 10 20 40 Feet

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by SJH | Checked by EKG

Issued for: Local Approvals

Date: February 9, 2022

Not Approved for Construction

Drawing Title: Layout and Materials Plan

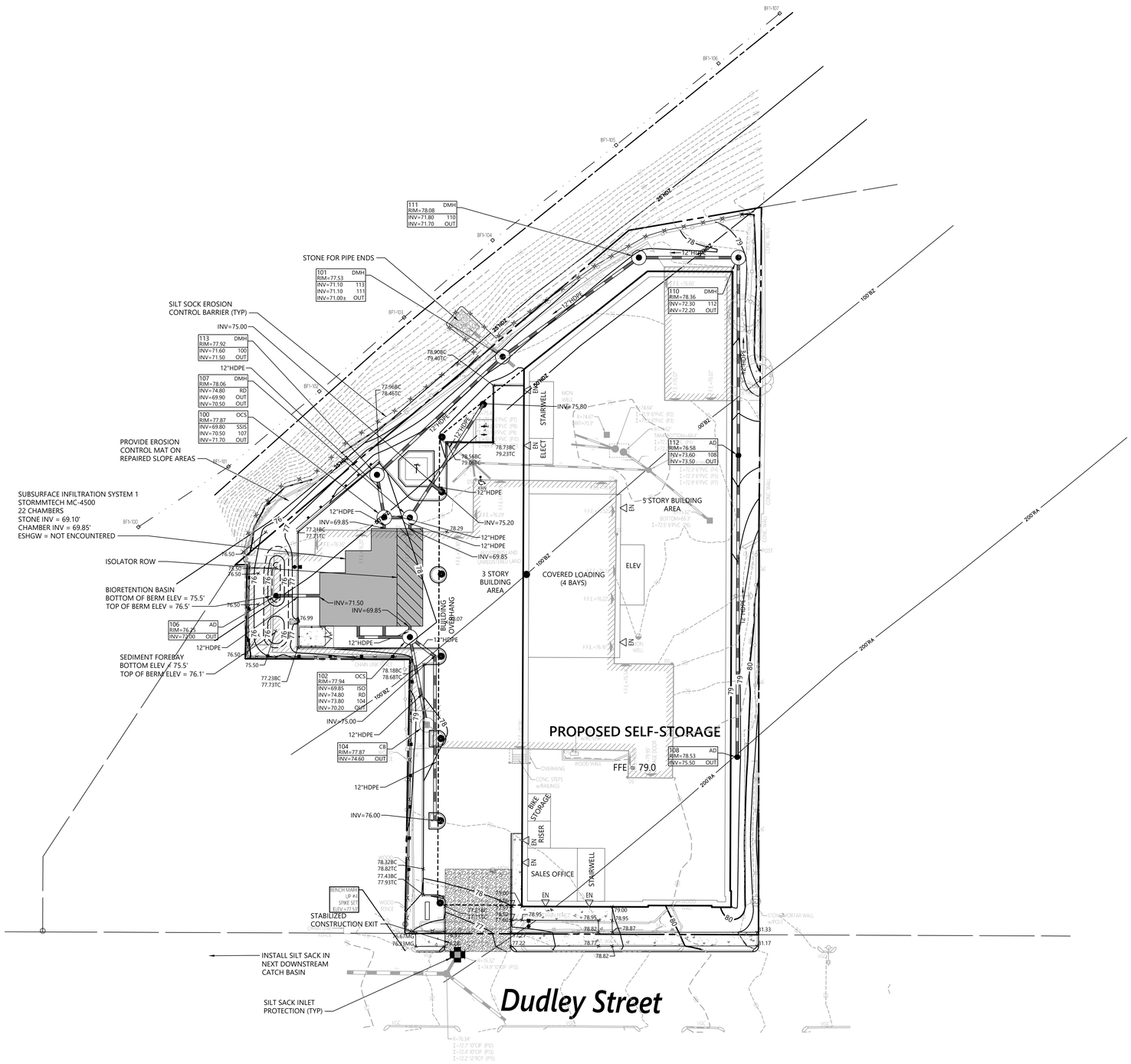
Drawing Number: C3.01

Sheet 3 of 10

Project Number: 52816.00

COMMONWEALTH OF MASSACHUSETTS ERIC K. GERADE CIVIL NO. 47090 REGISTERED PROFESSIONAL ENGINEER 2/9/2022

Saved Monday, February 14, 2022 1:39:28 PM EGERADE Plotted Monday, February 14, 2022 1:41:43 PM Eric Gerade



0 10 20 40 Feet

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by SJH | Checked by EKG

Issued for Local Approvals | Date February 9, 2022

Not Approved for Construction

Drawing Title
Grading, Drainage, and Erosion Control Plan

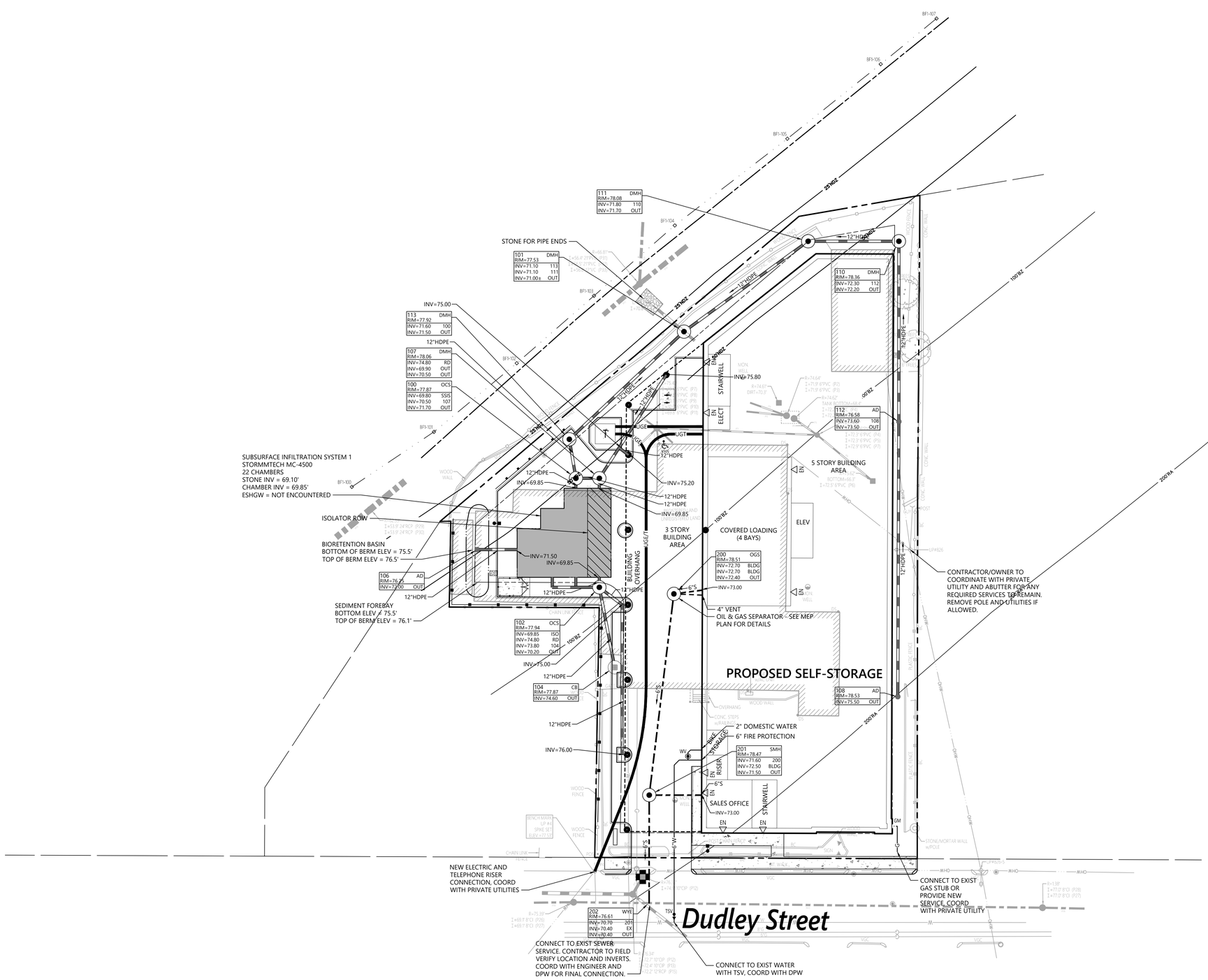
Drawing Number
C4.01

Sheet 4 of 10

Project Number
52816.00

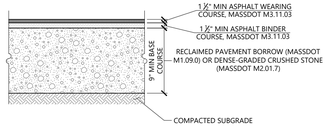
vhb.com
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

COMMONWEALTH OF MASSACHUSETTS
ERIC K. GERADE
CIVIL
No. 47000
REGISTERED PROFESSIONAL ENGINEER
2/9/2022


111 DMH
RIM=78.08
INV=71.80 110
INV=71.70 OUT
STONE FOR PIPE ENDS
101 DMH
RIM=77.53
INV=71.10 113
INV=71.10 111
INV=71.00± OUT
INV=75.00
113 DMH
RIM=77.92
INV=71.60 100
INV=71.50 OUT
12"HDPE
107 DMH
RIM=78.06
INV=74.80 RD
INV=69.90 OUT
INV=70.50 OUT
100 OCS
RIM=77.87
INV=69.80 SSS
INV=70.50 107
INV=71.70 OUT
SUBSURFACE INFILTRATION SYSTEM 1
STORMMTECH MC-4500
22 CHAMBERS
STONE INV = 69.10'
CHAMBER INV = 69.85'
ESHGW = NOT ENCOUNTERED
ISOLATOR ROW
BIORETENTION BASIN
BOTTOM OF BERM ELEV = 75.5'
TOP OF BERM ELEV = 76.5'
106 AD
RIM=76.25
INV=72.00 OUT
12"HDPE
SEDIMENT FOREBAY
BOTTOM ELEV = 75.5'
TOP OF BERM ELEV = 76.1'
102 OCS
RIM=77.94
INV=69.85 ISO
INV=74.80 RD
INV=73.80 104
INV=70.20 OUT
INV=75.00
12"HDPE
104 CB
RIM=77.87
INV=74.60 OUT
12"HDPE
INV=76.00
NEW ELECTRIC AND
TELEPHONE RISER
CONNECTION. COORD
WITH PRIVATE UTILITIES
202 WYE
RIM=76.61
INV=70.70 201
INV=70.40 EX
INV=70.40 OUT
CONNECT TO EXIST SEWER
SERVICE. CONTRACTOR TO FIELD
VERIFY LOCATION AND INVERTS.
COORD WITH ENGINEER AND
DPW FOR FINAL CONNECTION.
Dudley Street
CONNECT TO EXIST WATER
WITH TSV, COORD WITH DPW
12"HDPE
INV=75.80
STAIRWELL
ELECT
UGE
UGT
12"HDPE
INV=75.20
12"HDPE
12"HDPE
INV=69.85
INV=71.50
INV=69.85
BUILDING OVERHANG
12"HDPE
6"S
INV=73.00
4" VENT
OIL & GAS SEPARATOR - SEE MEP
PLAN FOR DETAILS
PROPOSED SELF-STORAGE
108 AD
RIM=78.53
INV=75.50 OUT
2" DOMESTIC WATER
6" FIRE PROTECTION
BIKE STORAGE
201 SMH
RIM=78.47
INV=71.60 200
INV=72.50 BLDG
INV=71.50 OUT
6"S
SALES OFFICE
INV=73.00
STAIRWELL
5 STORY BUILDING
AREA
3 STORY
BUILDING
AREA
COVERED LOADING
(4 BAYS)
ELEV
200 OGS
RIM=78.51
INV=72.70 BLDG
INV=72.70 BLDG
INV=72.40 OUT
110 DMH
RIM=78.36
INV=72.30 112
INV=72.20 OUT
112 AD
RIM=76.58
INV=73.60 108
INV=73.50 OUT
12"HDPE
150TBZ
200TBA
CONTRACTOR/OWNER TO
COORDINATE WITH PRIVATE
UTILITY AND ABUTTER FOR ANY
REQUIRED SERVICES TO REMAIN.
REMOVE POLE AND UTILITIES IF
ALLOWED.
CONNECT TO EXIST
GAS STUB OR
PROVIDE NEW
SERVICE. COORD
WITH PRIVATE UTILITY
BENCH MARK
LP # 4
SPIKE SET
ELEV.=77.53
BFI-100
BFI-101
BFI-102
BFI-103
BFI-104
BFI-105
BFI-106
BFI-107
25TBZ
50TBZ
75TBZ
100TBZ
125TBZ
150TBZ
200TBA
WOOD WALL
CHAIN LINK FENCE
WOOD FENCE
CONC. WALL
STONE/MORTAR WALL
BRICK WALL
PLASTIC FENCE
OVERHANG
CONC. STEPS
BUILDING OVERHANG
MON. WELL
UP #926
UP #927
UP #928
UP #929
UP #930
UP #931
UP #932
UP #933
UP #934
UP #935
UP #936
UP #937
UP #938
UP #939
UP #940
UP #941
UP #942
UP #943
UP #944
UP #945
UP

vhb.com

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770



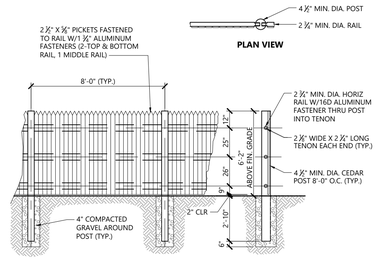
STANDARD DUTY FLEXIBLE PAVEMENT

NOTE

BASE COURSE FOR PAVEMENT SHOULD BE PLACED IN 12" THICK LOOSE LIFTS AND COMPACTED TO AT LEAST 95 PERCENT OF ITS MAXIMUM DRY DENSITY (MDD) AS DETERMINED BY ASTM D1557 METHOD C (MODIFIED PROTRACTOR).

Bituminous Concrete Pavement Section

N.T.S. Source: GeoEngineers, Inc.



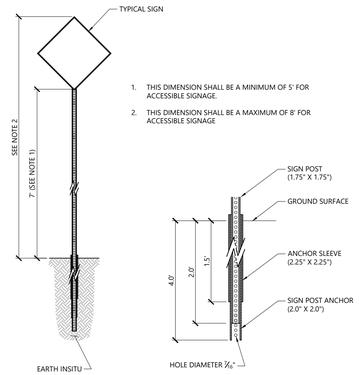
NOTES

1. ALL FENCING MATERIAL SHALL BE NORTHERN WHITE CEDAR, SAWN TO THE DIMENSIONS SHOWN ON THE DRAWING.
2. ALL FENCE POSTS SHALL BE TREATED WITH PRESERVATIVE PER MANUFACTURER'S RECOMMENDATION ON ALL SIDES FOR A DIMENSION OF 3'-0" FROM BUTT OF POST.
3. POSTS SHALL MAINTAIN A DEPTH OF 2'-10" IN GROUND AND SHALL NOT BE RACKED TO ACCOMMODATE CHANGES IN GRADE.
4. LINE OF FENCE TOP AND BOTTOM SHALL BE INSTALLED STRAIGHT AND TRUE. POSTS AND PICKETS SHALL BE INSTALLED PARALLEL AND PLUMB. RAILS SHALL BE INSTALLED PARALLEL TO GROUND SURFACE AND EACH OTHER.
5. GATE HARDWARE SHALL BE DOUBLE DIP HOT GALVANIZED. THE CONTRACTOR SHALL SUBMIT GATE AND FENCE SHOP DRAWINGS TO THE ENGINEER FOR REVIEW.

6' Single Sided Stockade Fence

1/16

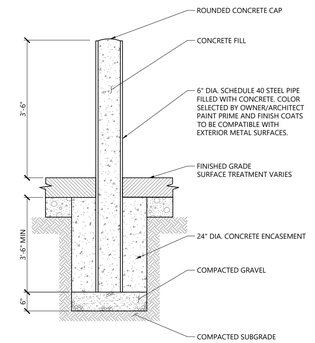
N.T.S. Source: VHB LD_470



Sign Post - Type 'B'

3/19

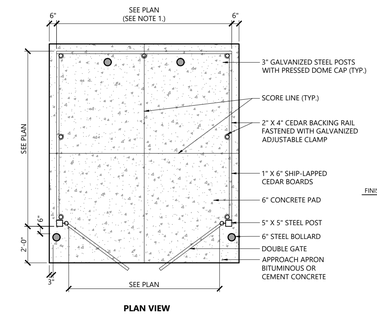
N.T.S. Source: VHB LD_702



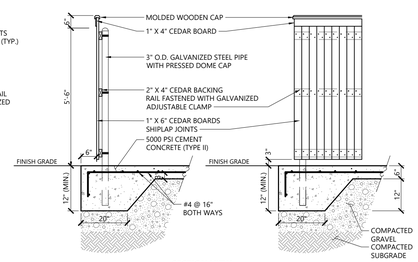
Bollard

12/19

N.T.S. Source: VHB LD_700



PLAN VIEW



SECTION VIEW

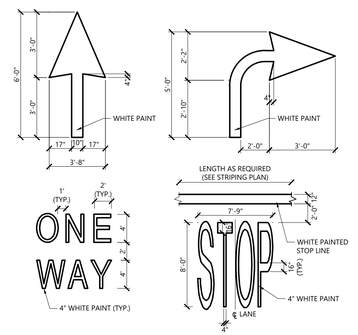
NOTES

1. DUMPSTER PAD DIMENSIONS SHOWN AS MINIMUM. REFER TO PLAN FOR ACTUAL DIMENSION.
2. PAD DESIGNED FOR 6 YARD DUMPSTER.

Dumpster Pad w/ Enclosure

1/20

N.T.S. Source: VHB LD_713



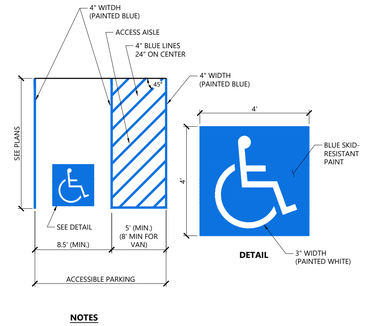
NOTES

1. PAVEMENT MARKINGS TO BE INSTALLED FOR ON SITE WORK IN LOCATIONS SHOWN.

Painted Pavement Markings - On Site

1/16

N.T.S. Source: VHB LD_554



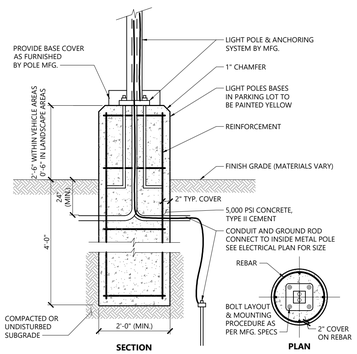
NOTES

1. ALL DIMENSIONS TO CENTER OF 4" PAVEMENT STRIPING.
2. ALL SLOPES THROUGHOUT THE ACCESSIBLE PARKING AND AISLE AREAS SHALL NOT EXCEED 1.5%.

Accessible Parking Space

12/19

N.T.S. Source: VHB LD_552B



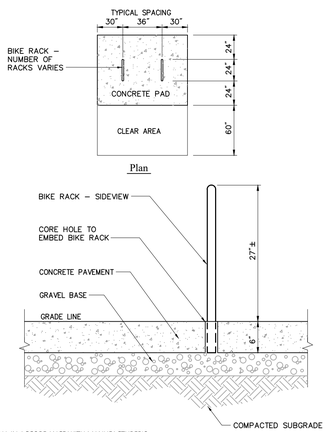
NOTES

DETAIL PROVIDED FOR GENERAL INFORMATION ONLY. CONTRACTOR TO PROVIDE STAMPED FINAL DESIGN OF LIGHT POLE FOUNDATION BASED ON RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER.

Light Pole Foundation Detail (Up to 15' Pole)

12/19

N.T.S. Source: VHB LD_310A

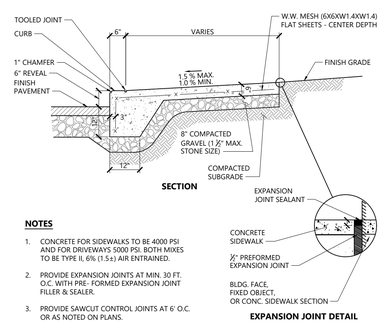


NOTES

1. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
2. FINAL BIKE RACK MAKE, MODEL, AND MANUFACTURER TO BE FINALIZED PRIOR TO CONSTRUCTION.

Bicycle Rack - Embedded

N.T.S. Source: VHB



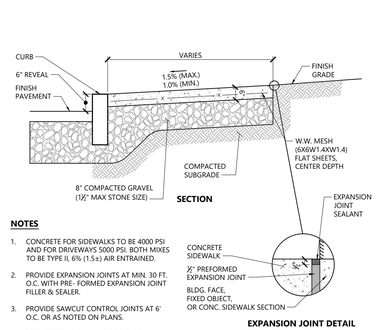
NOTES

1. CONCRETE FOR SIDEWALKS TO BE 4000 PSI AND FOR DRIVEWAYS 5000 PSI. BOTH MIXES TO BE TYPE II, 6% (1.5±) AIR ENTRAINED.
2. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE- FORMED EXPANSION JOINT FILLER & SEALER.
3. PROVIDE SAWCUT CONTROL JOINTS AT 6' O.C. OR AS NOTED ON PLANS.
4. PROVIDE BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
5. ALL EXPOSED CONCRETE SURFACES SHALL BE SEALED WITH A SILANE-SILOXANE PRODUCT.

Monolithic Concrete Curb (MCC) & Sidewalk

3/20

N.T.S. Source: VHB LD_421



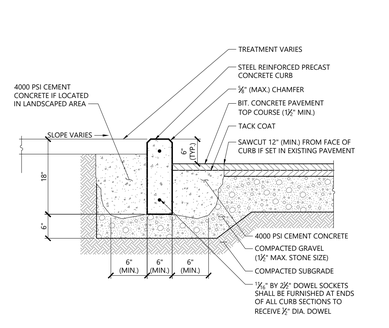
NOTES

1. CONCRETE FOR SIDEWALKS TO BE 4000 PSI AND FOR DRIVEWAYS 5000 PSI. BOTH MIXES TO BE TYPE II, 6% (1.5±) AIR ENTRAINED.
2. PROVIDE EXPANSION JOINTS AT MIN. 30 FT. O.C. WITH PRE- FORMED EXPANSION JOINT FILLER & SEALER.
3. PROVIDE SAWCUT CONTROL JOINTS AT 6' O.C. OR AS NOTED ON PLANS.
4. PROVIDE MEDIUM BROOM FINISH IN DIRECTION PERPENDICULAR TO CURB.
5. ALL EXPOSED CONCRETE SURFACES SHALL BE SEALED WITH A SILANE-SILOXANE PRODUCT.

Concrete Sidewalk

3/20

N.T.S. Source: VHB LD_420



Precast Concrete Curb (PCC)

3/20

N.T.S. Source: VHB LD_404

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by MEA Checked by EKG

Issued for: Local Approvals — Date: February 9, 2022

Not Approved for Construction

Drawing Title: Site Details 1

Drawing Number: C6.01

Sheet 6 of 10

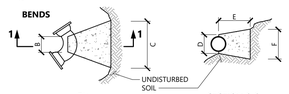
Project Number: 52816.00

Saved Monday, February 14, 2022 1:11:22 PM EGERADE Plotted Monday, February 14, 2022 1:16:38 PM Eric Gerade

TABLE OF DIMENSIONS

BENDS	B	C	D	E	F	BENDS	B	C	D	E	F
6" 11 ¼°	8"	15"	12"	24"	12"	6" 45°	8"	30"	12"	24"	14"
6" 22 ½°	"	19"	"	"	13"	6" 90°	"	30"	"	"	27"
8" 11 ¼°	"	20"	"	"	12"	8" 45°	"	30"	"	"	24"
8" 22 ½°	"	22"	"	"	17"	8" 90°	"	38"	"	"	36"
12" 11 ¼°	"	30"	"	"	15"	12" 45°	"	40"	"	"	40"
12" 22 ½°	"	35"	"	"	25"	12" 90°	"	60"	"	"	52"

BENDS

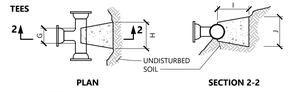


Plan SECTION 1-1

TABLE OF DIMENSIONS

TEES	G	H	I	J	TEES	G	H	I	J
6"X6"X6"	12"	24"	24"	18"	12"X12"X6"	12"	24"	24"	18"
8"X8"X6"	"	"	"	"	12"X12"X8"	"	"	"	24"
8"X8"X8"	"	"	"	24"	12"X12"X12"	"	36"	"	36"

TEES



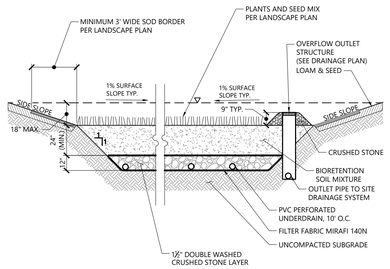
PLAN SECTION 2-2

NOTES

1. PROVIDE BLOCKS FOR TAPPING SLEEVES, DEAD ENDS, GATE VALVES, AND VERTICAL BENDS (SAME SIZE AS REQUIRED FOR TEES). PROVIDE ANCHOR RODS AT VERTICAL BENDS AND GATE VALVES.
2. CONCRETE SHALL NOT BE PLACED AGAINST PIPE BEYOND FITTING.
3. CONCRETE SHALL BE 3,000 PSI-TYPE I.

Concrete Thrust Block 1/16

N.T.S. Source: VHB LD_260

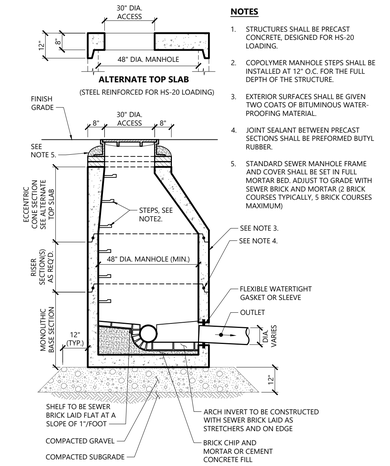


NOTES

1. INSTALL UNDERDRAINS AT 10 FEET ON CENTER. CONNECT TO DRAINS PER PLAN.
2. SIDE SLOPES SHALL BE 3:1 MAX. 2% MIN.

Bioretention Basin 3/20

N.T.S. Source: VHB LD_199

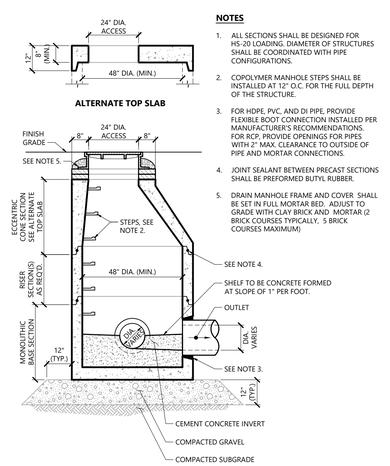


NOTES

1. STRUCTURES SHALL BE PRECAST CONCRETE, DESIGNED FOR HS-20 LOADING.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. STANDARD SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH SEWER BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Sanitary Sewer Manhole (SMH) 1/16

N.T.S. Source: VHB LD_200



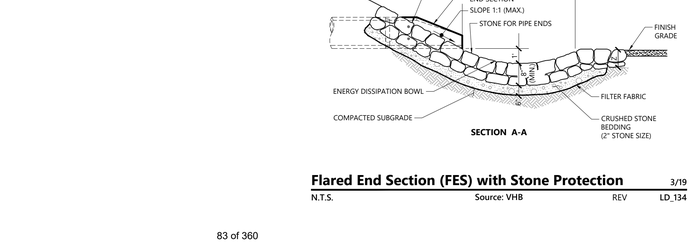
NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING. DIAMETER OF STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Drain Manhole (DMH) 11/19

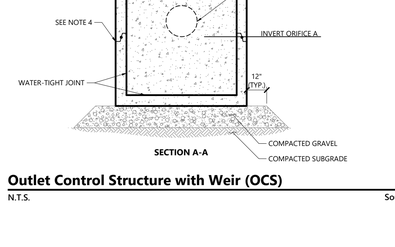
N.T.S. Source: VHB LD_115

vhb.com
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770



Typical Driveway with Sidewalk and Curved Transition Curb

N.T.S.

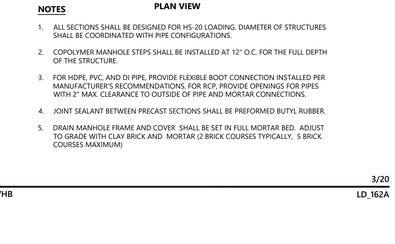


NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
2. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. CATCH BASIN FRAME AND GRATE SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).

Catch Basin (CB) With Oil/Debris Trap 3/21

N.T.S. Source: VHB LD_101

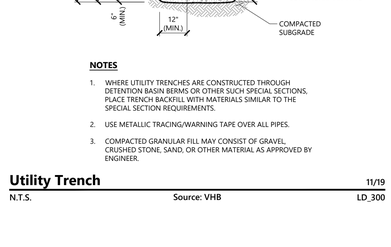


NOTES:

1. AREA DRAINS SHALL BE NYLOPLAST 12" DIAMETER DRAIN BASIN, OR APPROVED EQUAL.
2. GRATES SHALL BE NYLOPLAST 12" PEDESTRIAN MODEL 1299CGP OR 12" DOME GRATE MODEL 1299CGD (OR APPROVED EQUAL).

Area Drain (AD) Type 1 12/19

N.T.S. Source: VHB LD_193



NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING. DIAMETER OF STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

Drain Manhole (DMH) 11/19

N.T.S. Source: VHB LD_115

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by MEA Checked by EKG

Issued for Local Approvals Date February 9, 2022

Not Approved for Construction

Drawing Title: Site Details 2

Drawing Number C6.02

Sheet 7 of 10

Project Number 52816.00



Flared End Section (FES) with Stone Protection 3/19

N.T.S. Source: VHB REV LD_134

OUTLET STRUCTURE CHART

DETENTION BASIN	STRUCTURE NUMBER	TOP OF WEIR ELEVATION	DIMENSIONS ORIFICE A	INVERT ORIFICE A	DIMENSIONS ORIFICE B	INVERT ORIFICE B
SSIS 1	100	75.5	5" DIA.	71.5	N/A	N/A

Outlet Control Structure with Weir (OCS) 3/20

N.T.S. Source: VHB LD_162A

NOTES

1. ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING. DIAMETER OF STRUCTURES SHALL BE COORDINATED WITH PIPE CONFIGURATIONS.
2. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.
3. FOR HDPE, PVC, AND DI PIPE, PROVIDE FLEXIBLE BOOT CONNECTION INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. FOR RCP, PROVIDE OPENINGS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE AND MORTAR CONNECTIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
5. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM)

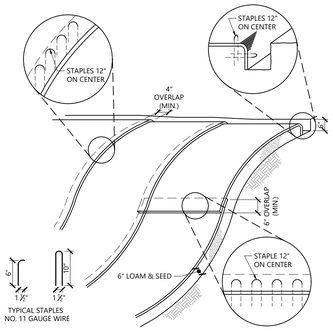
NOTES

1. WHERE UTILITY TRENCHES ARE CONSTRUCTED THROUGH DETENTION BASIN BERMS OR OTHER SUCH SPECIAL SECTIONS, PLACE TRENCH BACKFILL WITH MATERIALS SIMILAR TO THE SPECIAL SECTION REQUIREMENTS.
2. USE METALLIC TRACING/WARNING TAPE OVER ALL PIPES.
3. COMPACTED GRANULAR FILL MAY CONSIST OF GRAVEL, CRUSHED STONE, SAND, OR OTHER MATERIAL AS APPROVED BY ENGINEER.

Utility Trench 11/19

N.T.S. Source: VHB LD_300

Saved Monday, February 14, 2022 1:11:22 PM EGERADE Plotted Monday, February 14, 2022 1:16:47 PM Eric Gerade



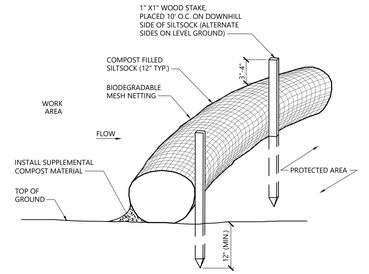
NOTES

1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS MUST BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS MUST BE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN.) OVERLAP AND STAPLE BOTH TOGETHER.
5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS.
6. EROSION CONTROL BLANKETS SHALL BE USED IN ALL AREAS WHERE SLOPES EXCEED 3:1.

Erosion Control Blanket Slope Installation

10/20

N.T.S. Source: VHB LD_680



NOTES

1. SILTSOCK SHALL BE FILTREXX SILTSOXX, OR APPROVED EQUAL.
2. SILTSOCKS SHALL OVERLAP A MINIMUM OF 12 INCHES.
3. SILTSOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
4. UPON SITE STABILIZATION, COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
5. IF NON BIODEGRADABLE NETTING IS USED THE NETTING SHALL BE COLLECTED AND DISPOSED OF OFFSITE.

Siltsock - Erosion Control Barrier

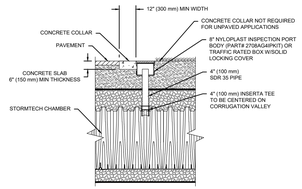
10/20

N.T.S. Source: VHB LD_658

vhb.com

vhb

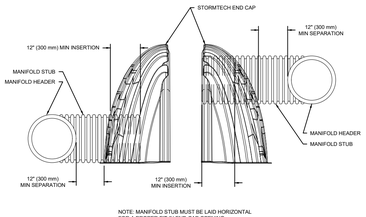
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770



NOTE:
INSPECTION PORTS MAY BE CONNECTED THROUGH ANY CHAMBER CORRUGATION VALLEY.

Stormtech Inspection Port

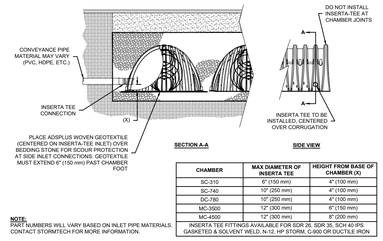
N.T.S. Source: Stormtech



NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

Stormtech End Cap Insertion

N.T.S. Source: Stormtech

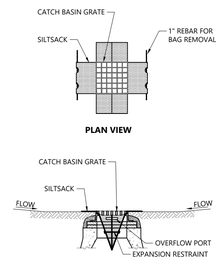


CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SOR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS. CONTACT STORMTECH FOR MORE INFORMATION.

Stormtech Inserta-Tee Side Inlet

N.T.S. Source: Stormtech



PLAN VIEW

SECTION VIEW

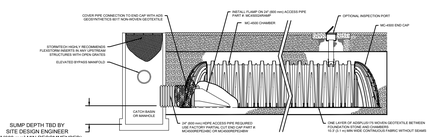
NOTES

1. INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND HAY BALES HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED

Siltsack Sediment Trap

1/20

N.T.S. Source: VHB LD_674



INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (IF NECESSARY)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

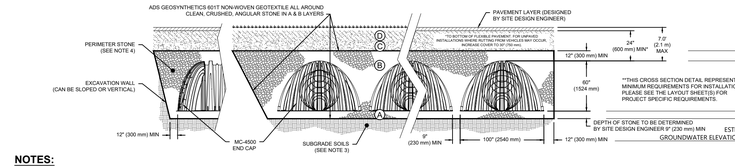
StormTech MC-4500 Isolator Row Profile

N.T.S. Source: StormTech

ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

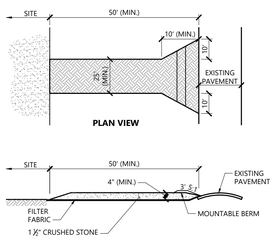


NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 60x101
2. MC-4500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.9 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

Subsurface Detention/Infiltration System (StormTech MC-4500)

N.T.S. Source: StormTech



PLAN VIEW

CROSS-SECTION

NOTES

1. EXIT WIDTH SHALL BE A TWENTY-FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

Stabilized Construction Exit

1/16

N.T.S. Source: VHB LD_682

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by: MEA
Checked by: EKG
Issued for: Local Approvals
Date: February 9, 2022

Not Approved for Construction

Drawing Title: Site Details 3

Drawing Number: C6.03

Sheet 8 of 10

Project Number: 52816.00



Saved Monday, February 14, 2022, 1:11:22 PM EGERADE Plotted Monday, February 14, 2022, 1:16:57 PM Eric Gerade

Planting Notes

1. ALL PROPOSED PLANTING LOCATIONS SHALL BE STAKED AS SHOWN ON THE PLANS FOR FIELD REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. CONTRACTOR SHALL VERIFY LOCATIONS OF ALL BELOW GRADE AND ABOVE GROUND UTILITIES AND NOTIFY OWNERS REPRESENTATIVE OF CONFLICTS.
3. NO PLANT MATERIALS SHALL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE OF ANY CONFLICT.
4. A 3-INCH DEEP MULCH PER SPECIFICATION SHALL BE INSTALLED UNDER ALL TREES AND SHRUBS, AND IN ALL PLANTING BEDS, UNLESS OTHERWISE INDICATED ON THE PLANS, OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
5. ALL TREES SHALL BE BALLED AND BURLAPPED, UNLESS OTHERWISE NOTED IN THE DRAWINGS OR SPECIFICATION, OR APPROVED BY THE OWNER'S REPRESENTATIVE.
6. FINAL QUANTITY FOR EACH PLANT TYPE SHALL BE AS GRAPHICALLY SHOWN ON THE PLAN. THIS NUMBER SHALL TAKE PRECEDENCE IN CASE OF ANY DISCREPANCY BETWEEN QUANTITIES SHOWN ON THE PLANT LIST AND ON THE PLAN. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE NUMBER OF PLANTS SHOWN ON THE PLANT LIST AND PLANT LABELS PRIOR TO BIDDING.
7. ANY PROPOSED PLANT SUBSTITUTIONS MUST BE REVIEWED BY LANDSCAPE ARCHITECT AND APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.
8. ALL PLANT MATERIALS INSTALLED SHALL MEET THE SPECIFICATIONS OF THE "AMERICAN STANDARDS FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND CONTRACT DOCUMENTS.
9. ALL PLANT MATERIALS SHALL BE GUARANTEED FOR ONE YEAR FOLLOWING DATE OF FINAL ACCEPTANCE.
10. AREAS DESIGNATED "LOAM & SEED" SHALL RECEIVE MINIMUM 6" OF LOAM AND SPECIFIED SEED MIX. LAWNS OVER 2:1 SLOPE SHALL BE PROTECTED WITH EROSION CONTROL FABRIC.
11. ALL DISTURBED AREAS NOT OTHERWISE NOTED ON CONTRACT DOCUMENTS SHALL BE LOAM AND SEEDED OR MULCHED AS DIRECTED BY OWNER'S REPRESENTATIVE.
12. THIS PLAN IS INTENDED FOR PLANTING PURPOSES. REFER TO SITE / CIVIL DRAWINGS FOR ALL OTHER SITE CONSTRUCTION INFORMATION.

Plant Maintenance Notes

1. CONTRACTOR SHALL PROVIDE COMPLETE MAINTENANCE OF THE LAWNS AND PLANTINGS. NO IRRIGATION IS PROPOSED FOR THIS SITE. THE CONTRACTOR SHALL SUPPLY SUPPLEMENTAL WATERING FOR NEW LAWNS AND PLANTINGS DURING THE ONE YEAR PLANT GUARANTEE PERIOD.
2. CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR, AND EQUIPMENT FOR THE COMPLETE LANDSCAPE MAINTENANCE WORK. WATER SHALL BE PROVIDED BY THE CONTRACTOR.
3. WATERING SHALL BE REQUIRED DURING THE GROWING SEASON, WHEN NATURAL RAINFALL IS BELOW ONE INCH PER WEEK.
4. WATER SHALL BE APPLIED IN SUFFICIENT QUANTITY TO THOROUGHLY SATURATE THE SOIL IN THE ROOT ZONE OF EACH PLANT.
5. CONTRACTOR SHALL REPLACE DEAD OR DYING PLANTS AT THE END OF THE ONE YEAR GUARANTEE PERIOD. CONTRACTOR SHALL TURN OVER MAINTENANCE TO THE FACILITY MAINTENANCE STAFF AT THAT TIME.

PLANT SCHEDULE

DECIDUOUS TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
AR	5	Acer rubrum	Red Maple	2 1/2 - 3" CAL.
CB	6	Carpinus betulus `Fastigiata`	Pyramidal European Hornbean	2 1/2 - 3" CAL.

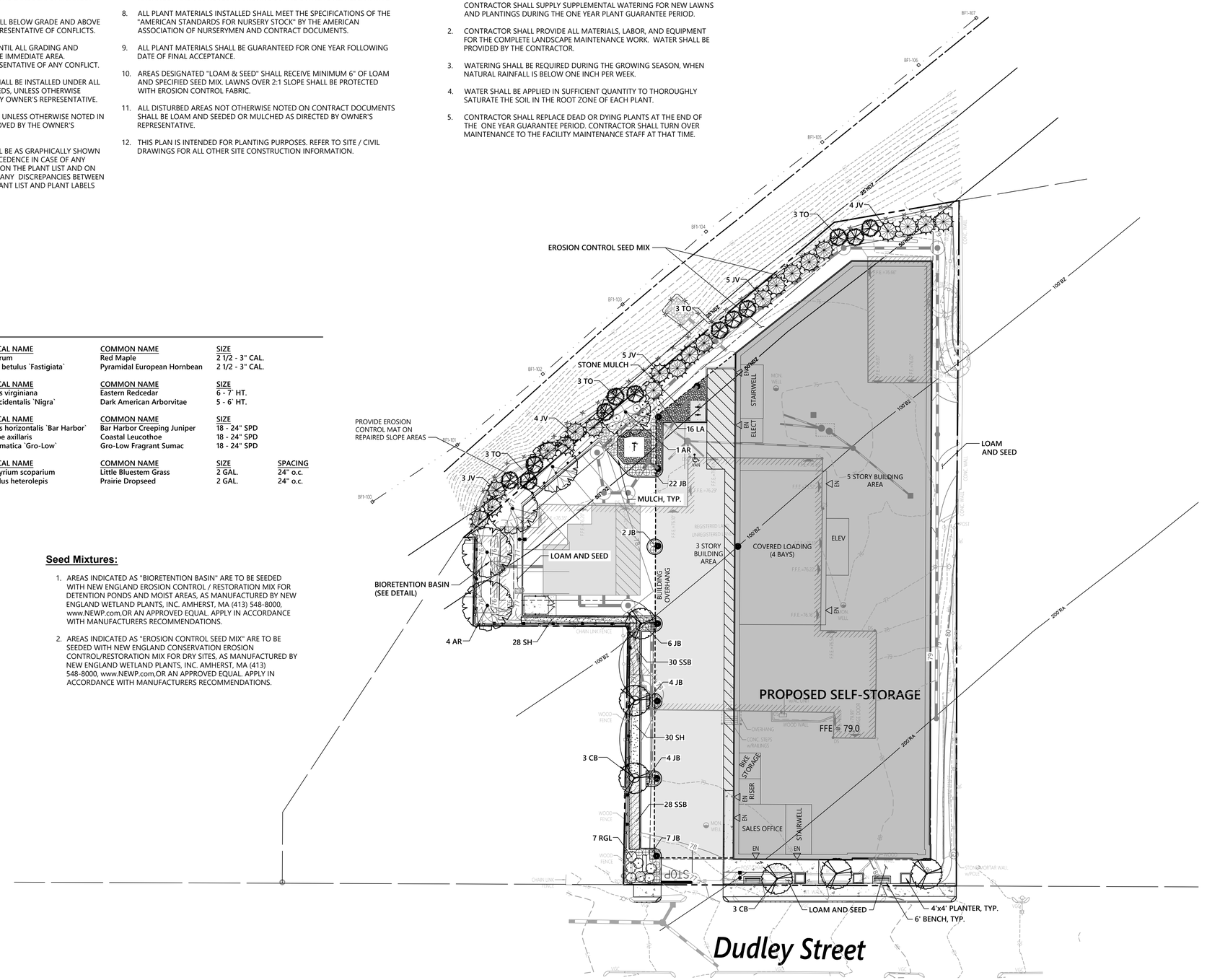
EVERGREEN TREES	QTY	BOTANICAL NAME	COMMON NAME	SIZE
JV	21	Juniperus virginiana	Eastern Redcedar	6 - 7` HT.
TO	12	Thuja occidentalis `Nigra`	Dark American Arborvitae	5 - 6` HT.

SHRUBS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
JB	45	Juniperus horizontalis `Bar Harbor`	Bar Harbor Creeping Juniper	18 - 24" SPD
LA	16	Leucothoe axillaris	Coastal Leucothoe	18 - 24" SPD
RGL	7	Rhus aromatica `Gro-Low`	Gro-Low Fragrant Sumac	18 - 24" SPD

ORNAMENTAL GRASSES	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
SSB	58	Schizachyrium scoparium	Little Bluestem Grass	2 GAL.	24" o.c.
SH	58	Sporobolus heterolepis	Prairie Dropseed	2 GAL.	24" o.c.

Seed Mixtures:

1. AREAS INDICATED AS "BIORETENTION BASIN" ARE TO BE SEEDED WITH NEW ENGLAND EROSION CONTROL / RESTORATION MIX FOR DETENTION PONDS AND MOIST AREAS, AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC. AMHERST, MA (413) 548-8000, www.NEWP.com,OR AN APPROVED EQUAL. APPLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
2. AREAS INDICATED AS "EROSION CONTROL SEED MIX" ARE TO BE SEEDED WITH NEW ENGLAND CONSERVATION EROSION CONTROL/RESTORATION MIX FOR DRY SITES, AS MANUFACTURED BY NEW ENGLAND WETLAND PLANTS, INC. AMHERST, MA (413) 548-8000, www.NEWP.com,OR AN APPROVED EQUAL. APPLY IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.



vhb.com
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

0 10 20 40 Feet

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by SJH | Checked by EKG

Issued for: Local Approvals — Date: February 9, 2022

Not Approved for Construction

Drawing Title: Planting Plan

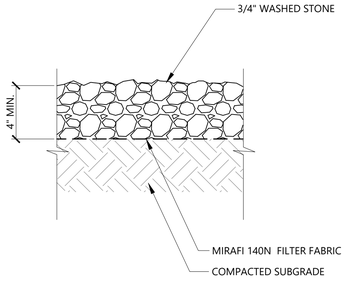
Drawing Number: L1.01

Sheet 9 of 10

Project Number: 52816.00

MASSACHUSETTS ERIK BEDMAR NO. 1508 REGISTERED LANDSCAPE ARCHITECT
2/9/2022

Saved Tuesday, February 8, 2022 3:35:37 PM WHAGEN Plotted Monday, February 14, 2022 9:59:59 AM Win Hagen



NOTES

1. EDGE CONDITIONS VARIES. WHERE STONE MUCH DOES NOT ABUT CURB OR BUILDING FACE PROVIDE 12" LONG STEEL EDGING

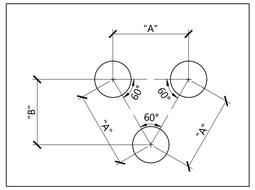
Stone Mulch

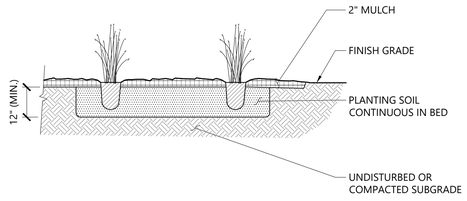
11/15

N.T.S. Source: VHB LD_

PLANT SPACING

PLANT SPACING("A")	ROW SPACING ("B")
6 IN. O.C.	5 IN. O.C.
8 IN. O.C.	7 IN. O.C.
10 IN. O.C.	8 ½ IN. O.C.
12 IN. O.C.	10 ½ IN. O.C.
15 IN. O.C.	13 IN. O.C.
18 IN. O.C.	16 IN. O.C.
24 IN. O.C.	21 IN. O.C.
30 IN. O.C.	26 IN. O.C.
36 IN. O.C.	30 IN. O.C.
48 IN. O.C.	42 IN. O.C.
54 IN. O.C.	48 IN. O.C.
60 IN. O.C.	54 IN. O.C.

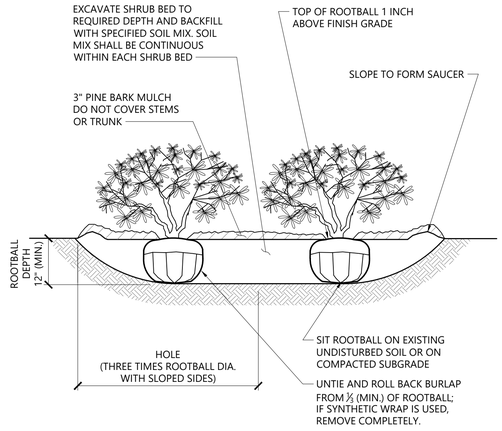




Perennial and Ornamental Grass Planting

1/16

N.T.S. Source: VHB LD_618



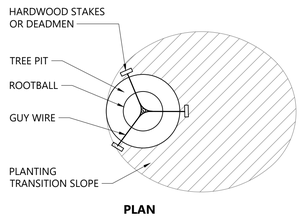
NOTES

1. LOOSEN ROOTS AT THE OUTER EDGE OF ROOTBALL OF CONTAINER GROWN SHRUBS.

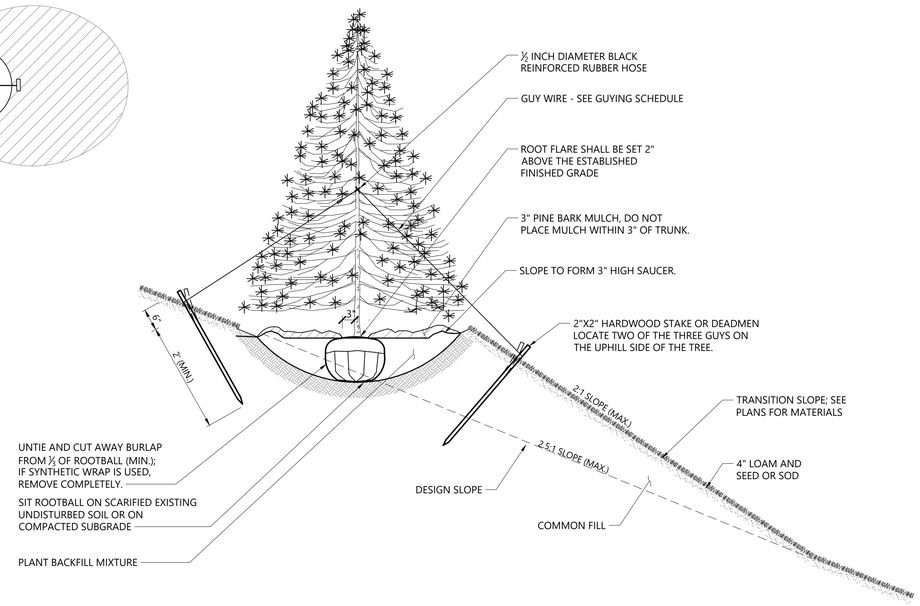
Shrub Bed Planting

1/16

N.T.S. Source: VHB LD_601



PLAN



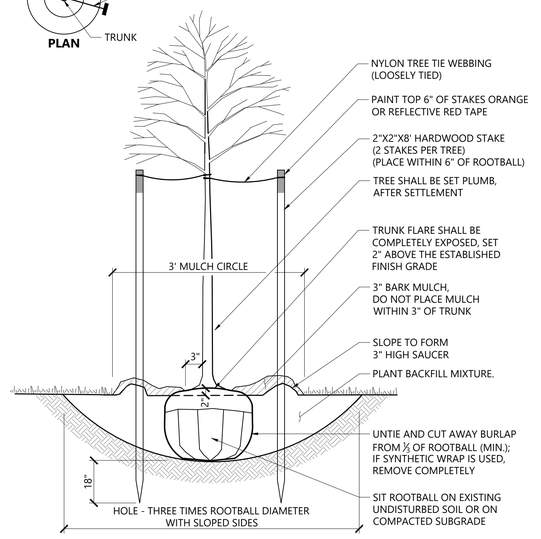
Tree Planting on Slope

1/16

N.T.S. Source: VHB LD_605



PLAN



Tree Planting (For Trees Under 4" Caliper)

9/21

N.T.S. Source: VHB LD_602

vhb.com

101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Proposed Self-Storage Facility

34 Dudley St
Arlington, Massachusetts 02476

No.	Revision	Date	Appvd.

Designed by SJH Checked by EKG

Issued for Local Approvals Date February 9, 2022

Not Approved for Construction

Drawing Title
Planting Details

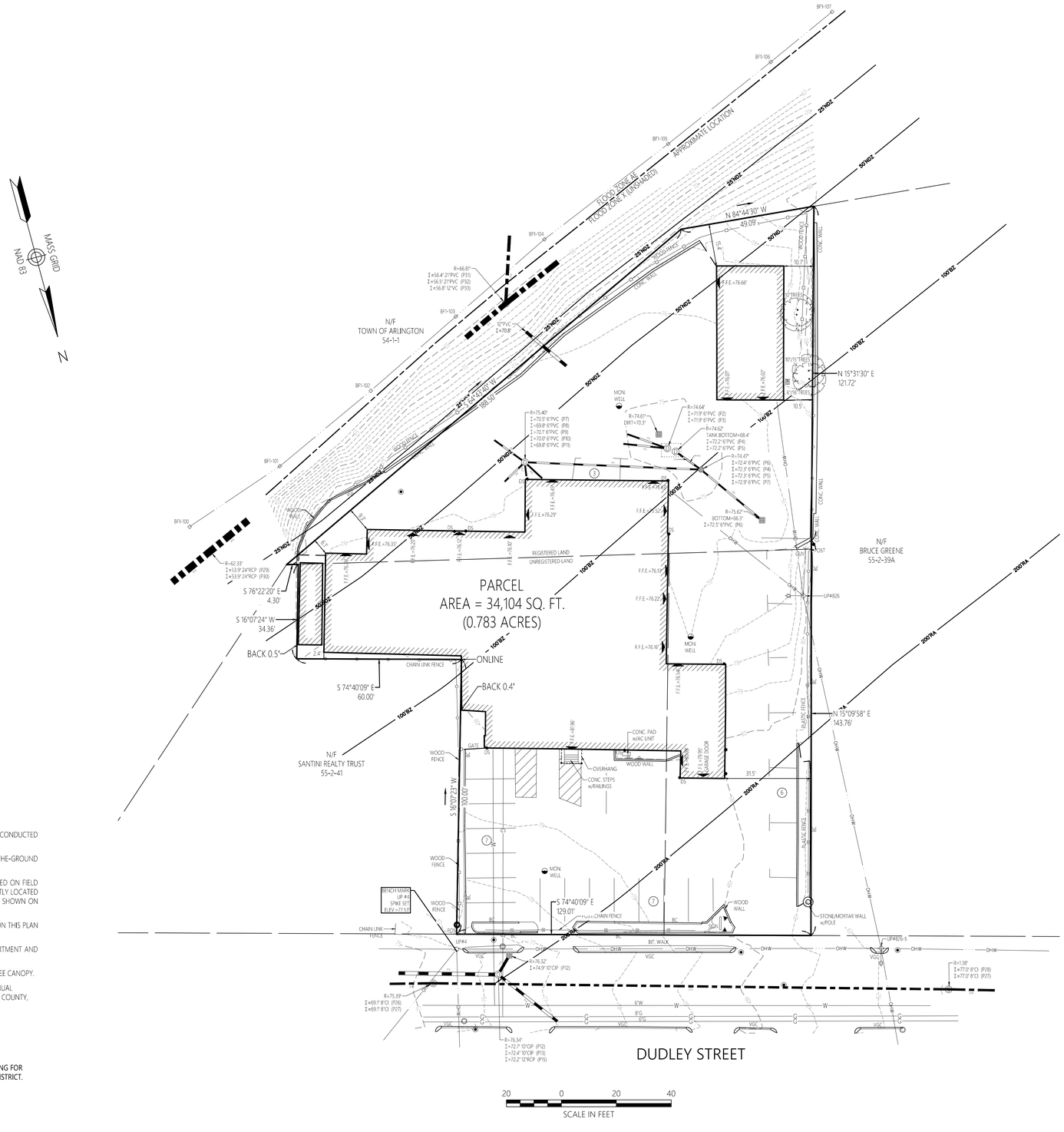
Drawing Number
L2.01

Sheet 10 of 10

Project Number
52816.00



Saved Tuesday, February 8, 2022 10:57:43 AM VHAGEN Plotted Tuesday, February 8, 2022 3:35:14 PM Win Hagen



General Notes

1) THE PROPERTY LINES SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL FIELD SURVEY CONDUCTED BY VHB, INC. IN OCTOBER, 2021 AND FROM DEEDS AND PLANS OF RECORD.
2) THE EXISTING CONDITIONS SHOWN ON THIS PLAN ARE BASED UPON AN ACTUAL ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY VHB, INC. IN OCTOBER, 2021.
3) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE BASED ON FIELD OBSERVATIONS AND INFORMATION OF RECORD. THEY ARE NOT WARRANTED TO BE EXACTLY LOCATED NOR IS IT WARRANTED THAT ALL UNDERGROUND UTILITIES OR OTHER STRUCTURES ARE SHOWN ON THIS PLAN.
4) HORIZONTAL DATUM IS BASED ON MASS. GRID SYSTEM, NAD 1983. ELEVATIONS SHOWN ON THIS PLAN REFER TO NAVD OF 1988.
5) THE WETLANDS SHOWN ON THIS PLAN WERE FLAGGED BY VHB ENVIRONMENTAL DEPARTMENT AND FIELD SURVEYED BY VHB IN OCTOBER, 2021.
6) THE TREE SYMBOL OUTLINE SHOWN ON THIS PLAN DOES NOT REPRESENT THE ACTUAL TREE CANOPY.
7) THE LOT LIES ENTIRELY WITHIN ZONE X (UNSHADED) (AREAS TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) AS SHOWN ON THE FLOOD INSURANCE RATE MAP FOR MIDDLESEX COUNTY, MASSACHUSETTS, MAP NUMBER 25017C0416E, EFFECTIVE DATE JUNE 4, 2010.

Zoning

THE LOT LIES ENTIRELY WITHIN THE INDUSTRIAL DISTRICT (I) AS SHOWN ON GIS MAPPING FOR THE TOWN OF ARLINGTON MASSACHUSETTS" AND THE INLAND WETLAND OVERLAY DISTRICT. DIMENSIONAL REQUIREMENTS FOR A (I) AT THE TIME OF THIS SURVEY ARE:

	REQUIRED	EXISTING
MINIMUM LOT AREA	N/A	34,104 S.F
MINIMUM FRONTAGE	N/A	129.01 FEET
MINIMUM FRONT YARD SETBACK	10 FEET	57.0 FEET
MINIMUM SIDE YARD SETBACK	10 FEET	0.0 FEET
MINIMUM REAR YARD SETBACK	10 FEET	6.1 FEET
MAXIMUM BUILDING HEIGHT	65*/39 FEET	23.8 FEET

*SUBJECT TO AMENITY REQUIREMENTS IN SECTION 5.6.2 D(7)

Saved Monday, February 7, 2022 9:14:56 AM RBOUSQUET Plotted Monday, February 7, 2022 9:15:43 AM Russell Bousquet

vhb.com
vhb
101 Walnut Street
PO Box 9151
Watertown, MA 02471
617.924.1770

Legend

- DRAIN MANHOLE
- CATCH BASIN
- SEWER MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- MANHOLE
- HH HAND HOLE
- WATER GATE
- FIRE HYDRANT
- GAS GATE
- BOLLARD w/LIGHT
- STREET SIGN
- LIGHT POLE
- UTILITY POLE
- GUY POLE
- GUY WIRE
- MONITORING WELL
- FLOOD LIGHT
- W WELL
- MARSH
- F.F.E.=45.27' FINISHED FLOOR ELEVATION
- CNO COULD NOT OPEN
- NPV NO PIPES VISIBLE
- DYL DOUBLE YELLOW LINE
- DWL DASHED WHITE LINE
- SYL SINGLE YELLOW LINE
- LSA LANDSCAPED AREA
- EOP EDGE OF PAVEMENT
- CC CONCRETE CURB
- VGC VERTICAL GRANITE CURB
- SGE SLOPED GRANITE EDGE
- BB BITUMINOUS BERM
- BC BITUMINOUS CURB
- GUARD RAIL
- CHAIN LINK FENCE
- DRAINAGE LINE
- SEWER LINE
- OHW OVERHEAD WIRE
- E UNDERGROUND ELECTRIC
- T TELEPHONE LINE
- G GAS LINE
- W WATER LINE
- STONE WALL
- 100'BZ 100-FT BUFFER ZONE
- 100'RA 100-FT RIVER FRONT AREA
- 200'RA 200-FT RIVER FRONT AREA
- 301'±100' LIMIT MEAN ANNUAL HIGH WATER
- BF1=100 LIMIT OF BANK
- WF1=100 VEGETATED WETLAND BOUNDARY

Self-Storage

34 Dudley Street
Arlington, Massachusetts

No.	Revision	Date	Appvd.

Designed by | Checked by

Issued for | Date

October 28, 2021

Drawing Title

Existing Conditions Plan of Land

Drawing Number

Sv-1

Sheet 1 of 1

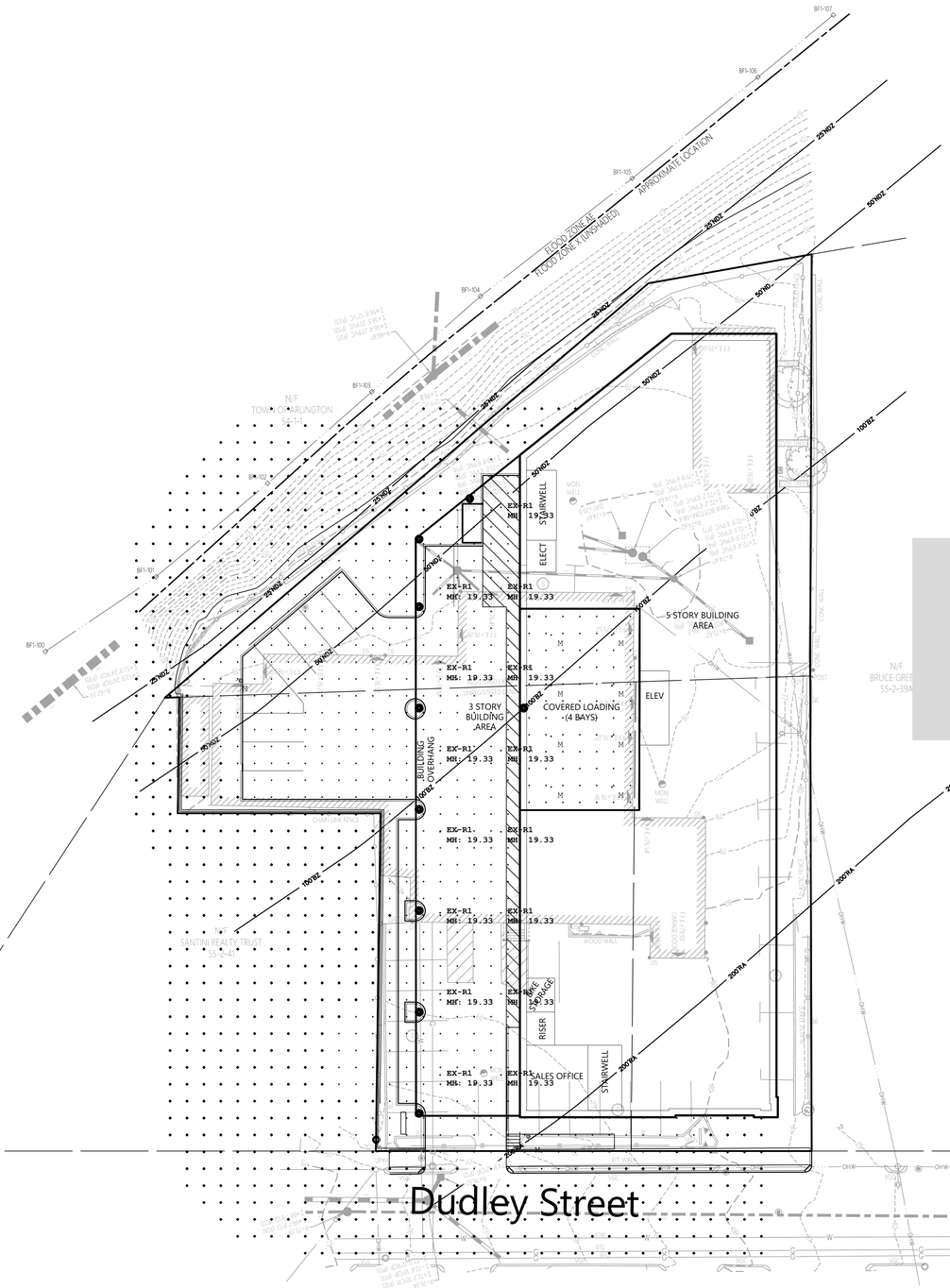
Project Number **52816.00**

COMMONWEALTH OF MASSACHUSETTS
RUSSELL J. BOUSQUET
NO. 35389
REGISTERED LAND SURVEYOR

2-7-2022

r	d				
			rr		r
			I		
			I		
			I		I
			I		

r							
			M	M		M	M M
I							
I							



DUDLEY STREET

OPTICS STRIKE

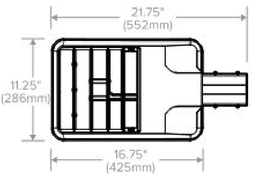
VIPER S

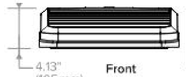
SMALL VIPER LUMINAIRE

CATALOG #:



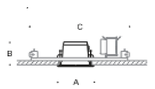
DIMENSIONS





Weight	15.0 lbs (6.8 kg)
EPA	.67 ft²





LED recessed ceiling downlights - wide beam

	LED	β	A	B	C
24827	24.5W	29°	6⅞	5	18

β = Beam angle

Project: Arlington Self Storage - 34 Dudley Street - Site	
Contact: Paul Abdella, Specification Sales, (781) 272-2300 X208, pabdella@omnilite.com	Detail: Photometric Calculation Date: 02/09/2022 Revision: 2 Scale: 1" = 20'-0" Drawn By: SHJ
illuminate 44 Sixth Road Woburn, MA 01801 (781) 935-8500 333 Pleasant Valley Road South Windsor, CT 06074 (860) 282-0597	Drawing Number: SL-1 Sheet 1 of 1



1st. FLOOR GROSS
13,677 sq.ft. - Storage
852 sq.ft. - Office
14,529 sq. ft TOTAL

BUILDING GROSS
94,854 sq.ft. - Storage
852 sq.ft. - Office
95,706 sq. ft TOTAL

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
IAN MICHAEL BRAY
No. 953114
MINT HILL
NC
COMMONWEALTH OF MASSACHUSETTS
02/09/22

Local Approvals Submission
February 09, 2022

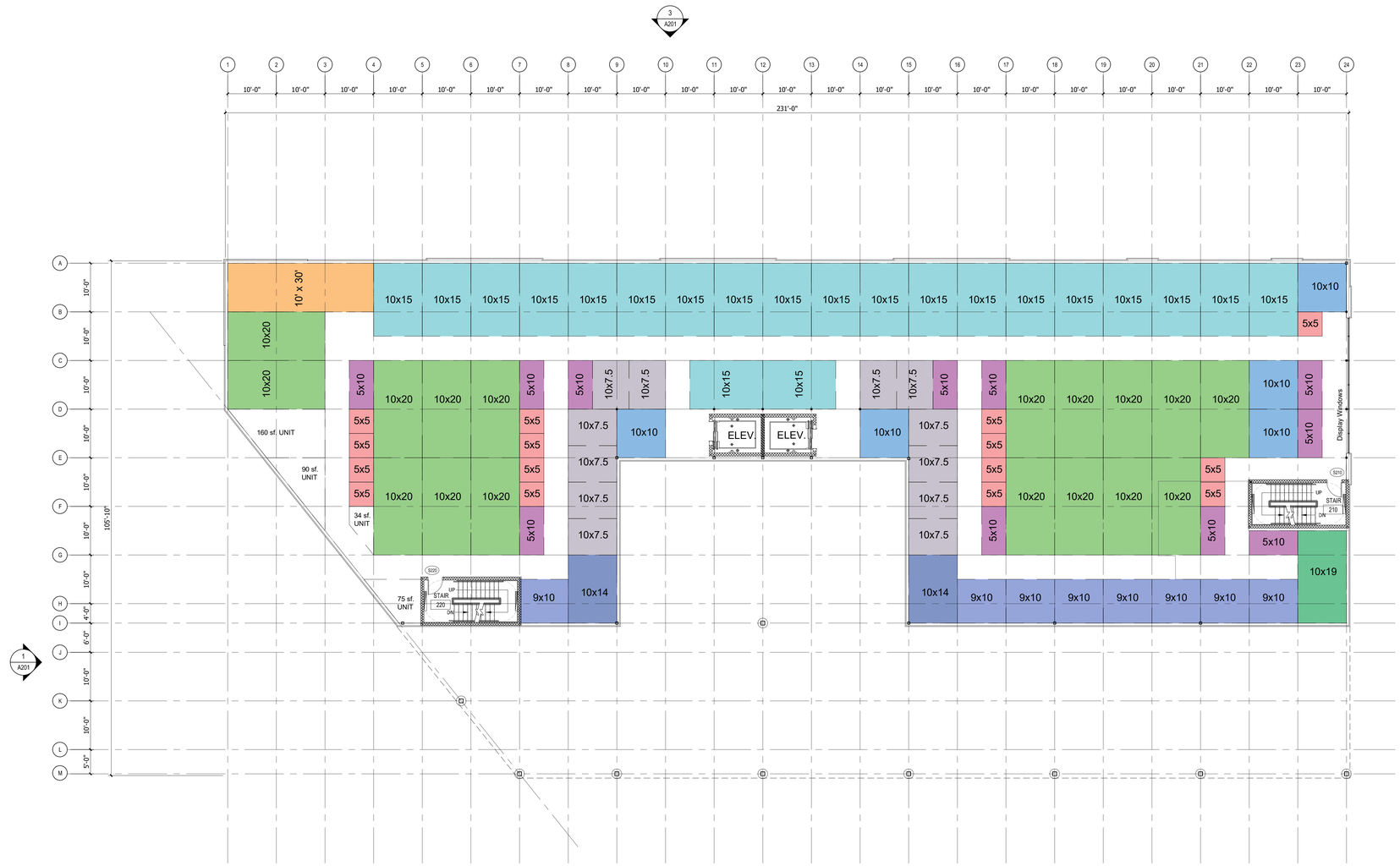
REVISIONS

No.	Description	Date

1st. FLOOR PLAN

A-101

Copyright 2021 Michael Parker Studios PLLC



2nd. FLOOR GROSS
14,529 sq. ft TOTAL

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER
STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAY MICHAEL PARKER
No. 053114
MINT HILL
NC
COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

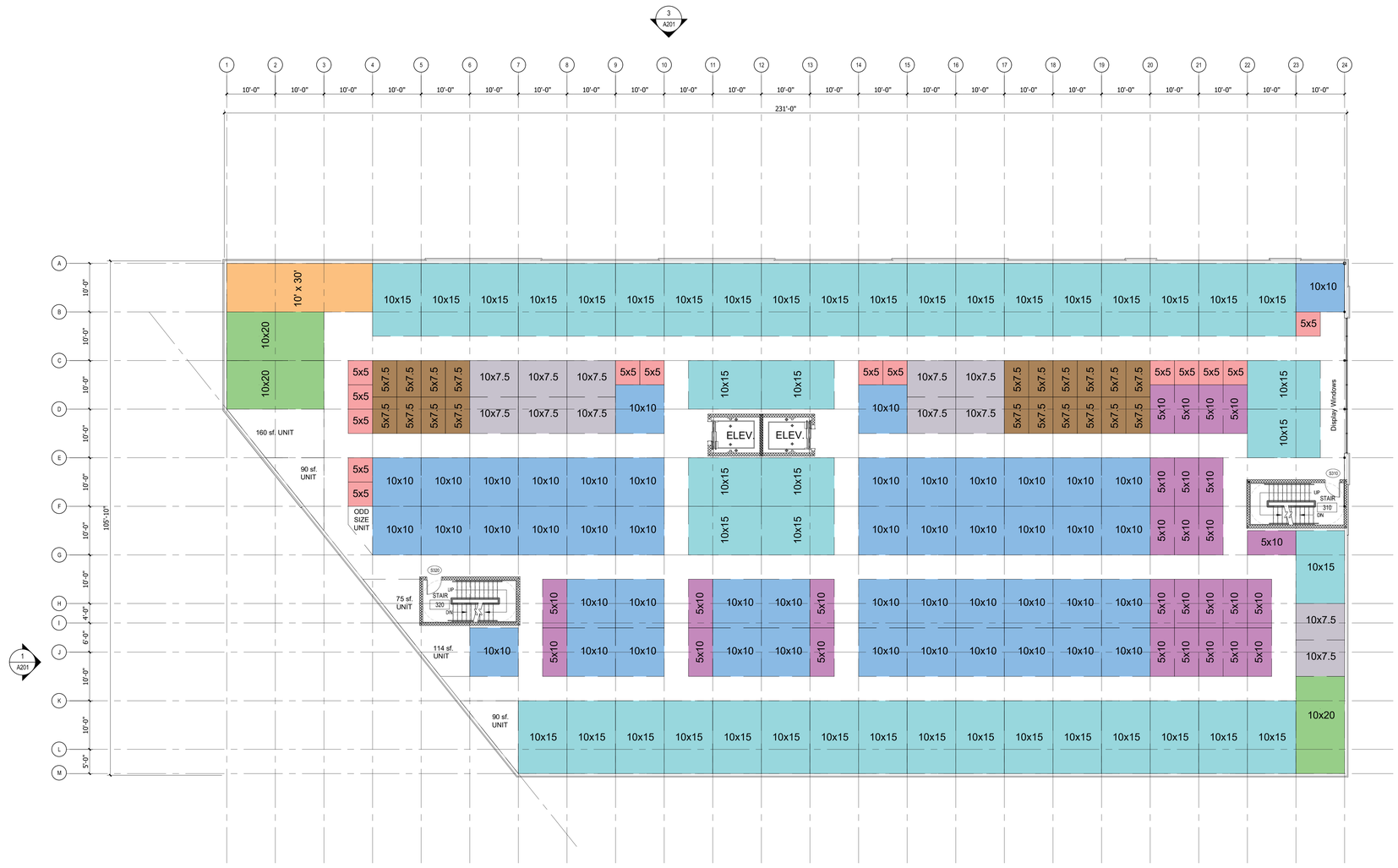
REVISIONS

No.	Description	Date

2nd. FLOOR PLAN

A-102

Copyright 2021 Michael Parker Studios PLLC



3rd. FLOOR GROSS
22,216 sq. ft TOTAL

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAN MICHAEL BIAS
No. 953114
MINT HILL, NC
COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

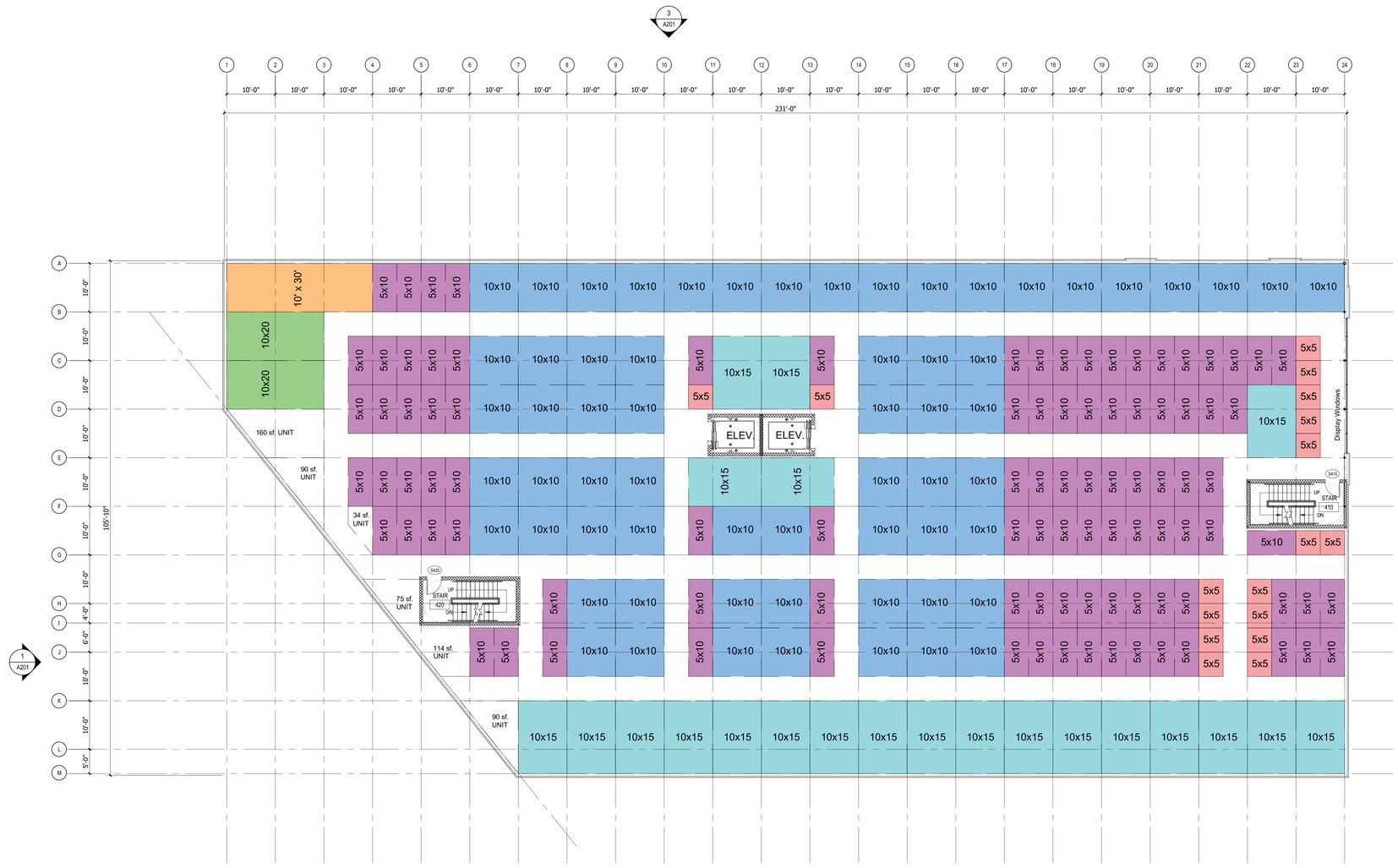
REVISIONS

No.	Description	Date

3rd. FLOOR PLAN

A-103

Copyright 2021 Michael Parker Studios PLLC



4th. FLOOR GROSS
22,216 sq. ft TOTAL

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAN MICHAEL BIALL
No. 953114
MINT HILL, NC
COMMONWEALTH OF MASSACHUSETTS
02/09/22

Local Approvals Submission
February 09, 2022

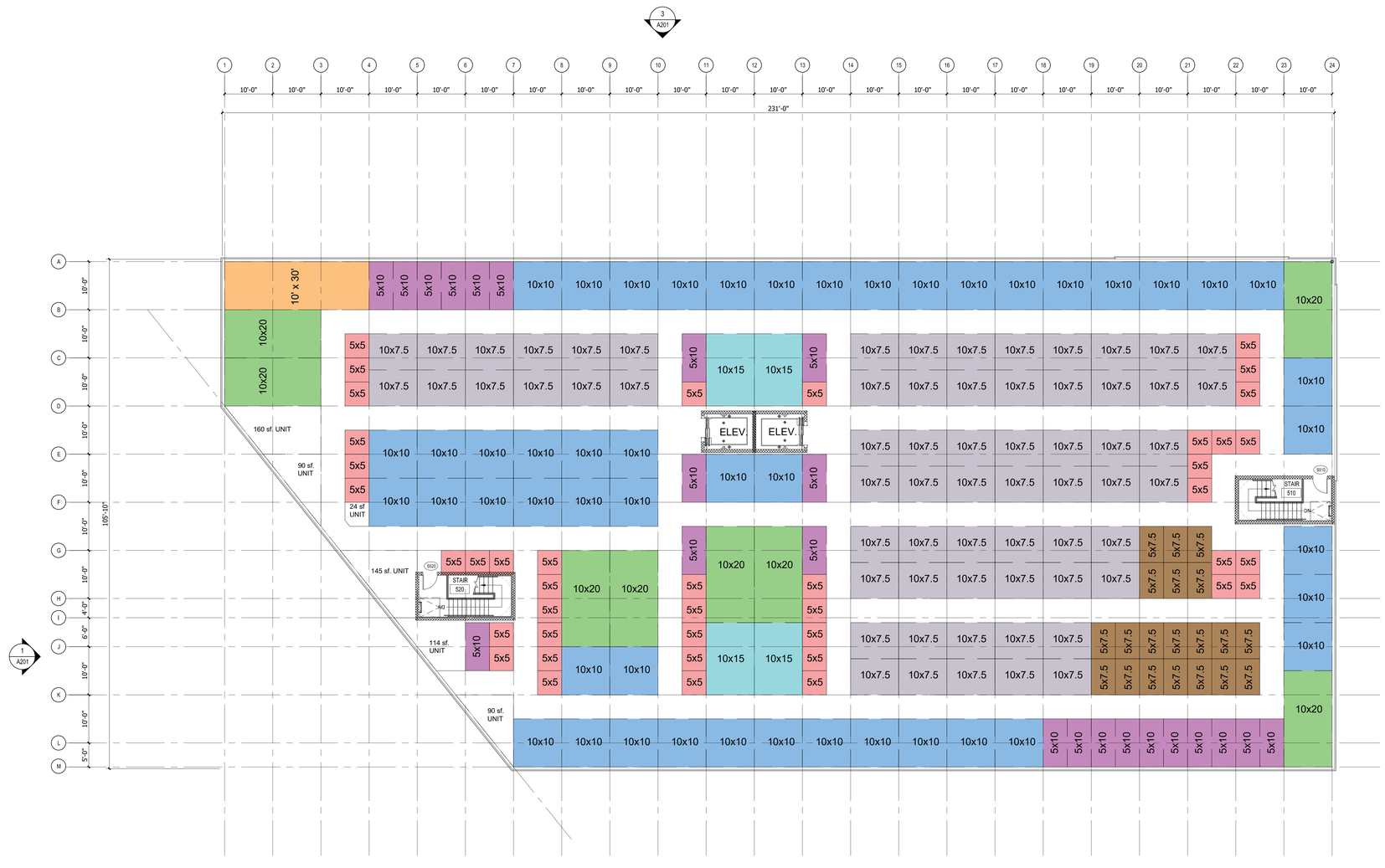
REVISIONS

No.	Description	Date

4th. FLOOR PLAN

A-104

Copyright 2021 Michael Parker Studios PLLC



5th. FLOOR GROSS
22,216 sq. ft TOTAL

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAN MICHAEL BRAUN
No. 953114
MINT HILL
NC
COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

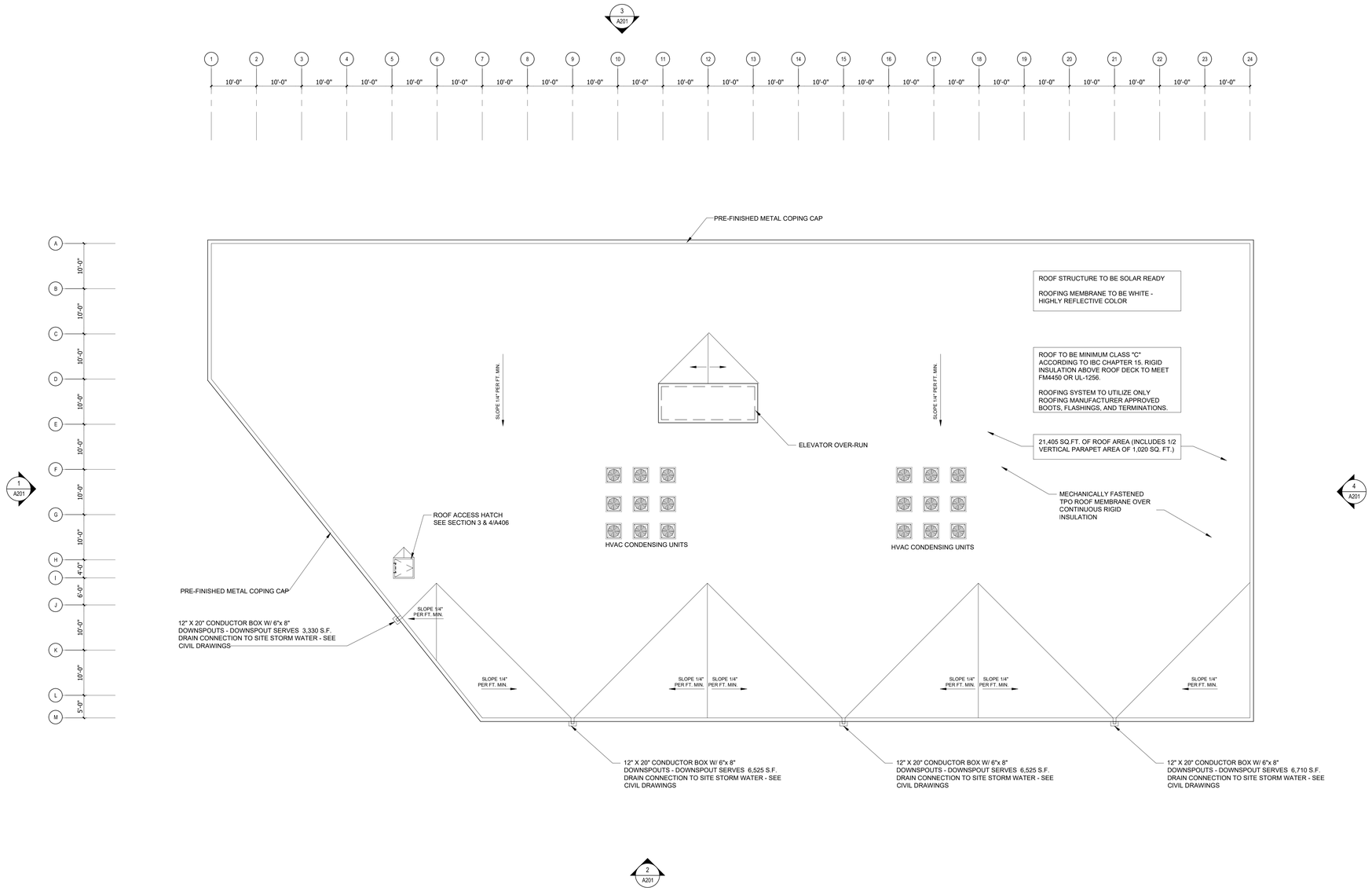
REVISIONS

No.	Description	Date

5th. FLOOR PLAN

A-105

Copyright 2021 Michael Parker Studios PLLC



michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAN MICHAEL BAYER
No. 953114
MINT HILL, NC
COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

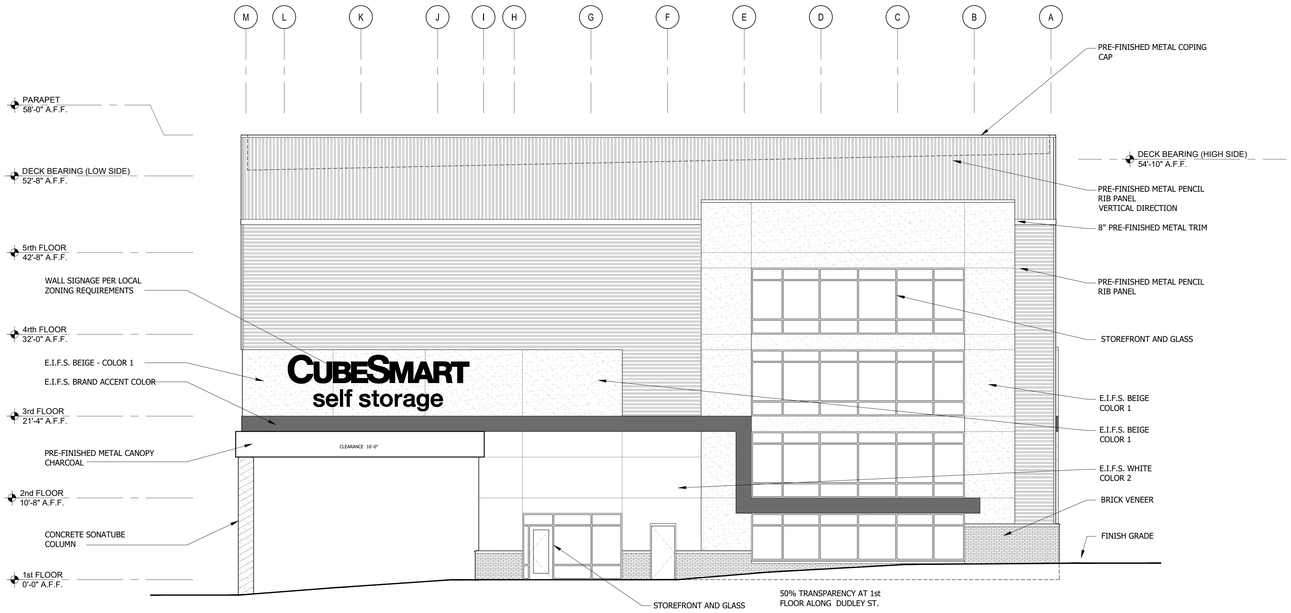
REVISIONS

No.	Description	Date

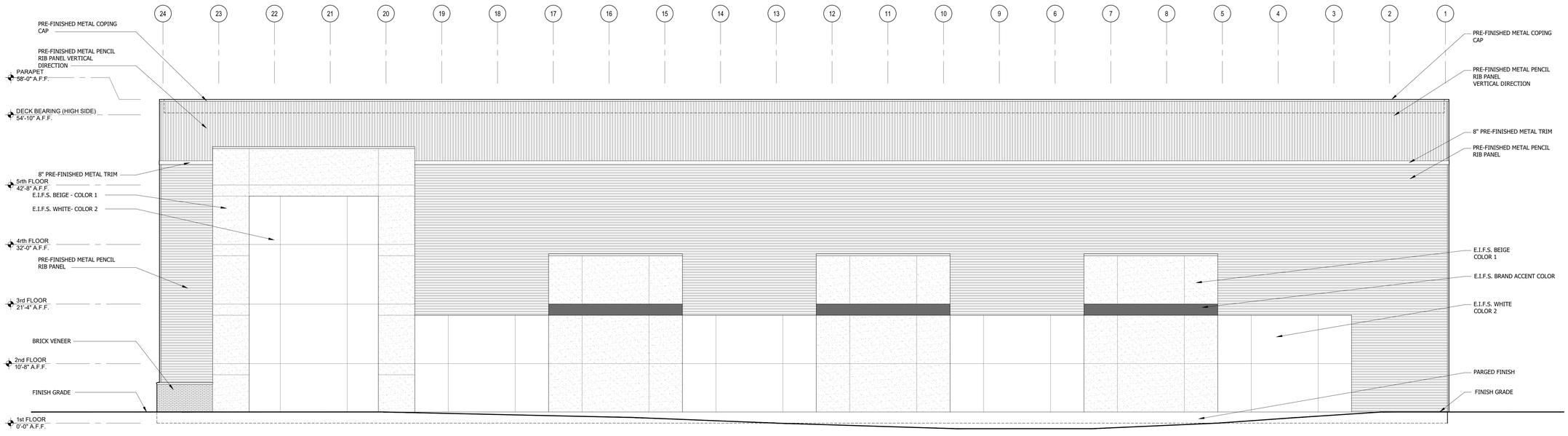
ROOF PLAN

A-106

Copyright 2021 Michael Parker Studios PLLC



2 ELEVATION - NORTH — scale: 1/8"=1'-0"



1 ELEVATION - WEST — scale: 1/8"=1'-0"

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT — JAY MICHAEL SEITZ — No. 9531 — MINT HILL NC — COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

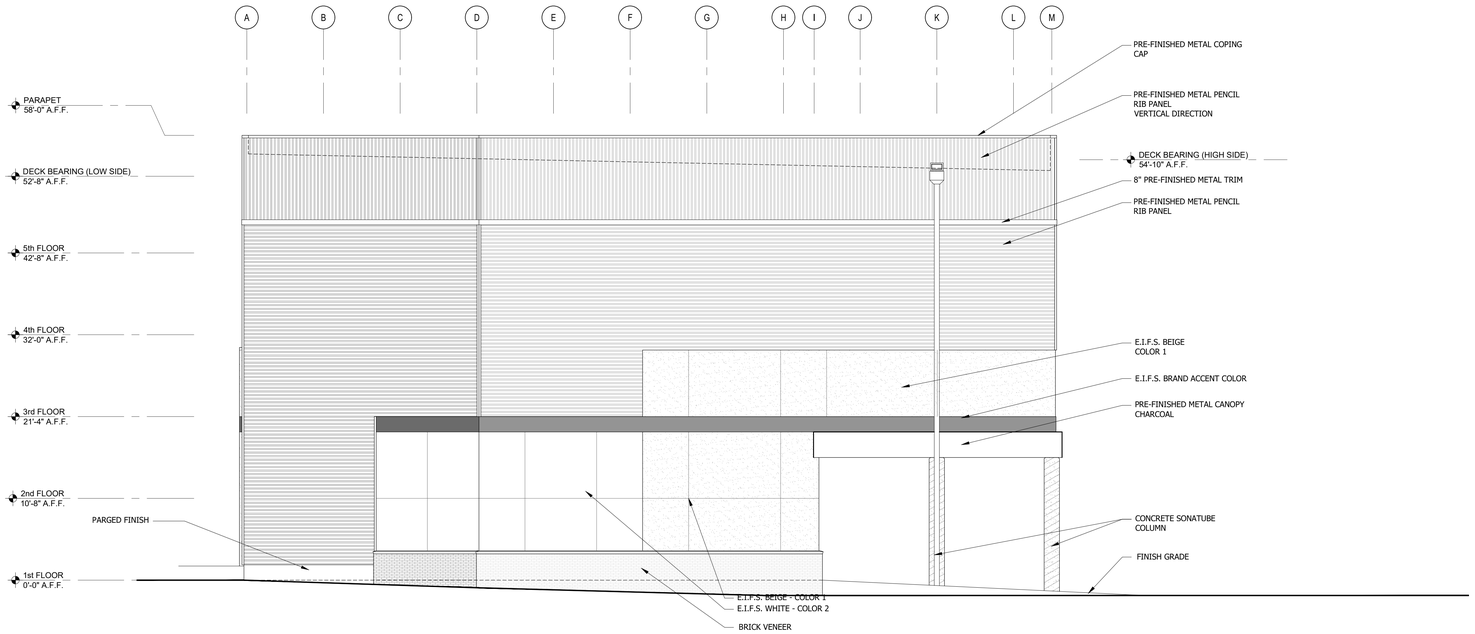
REVISIONS

No.	Description	Date

EXTERIOR ELEVATIONS

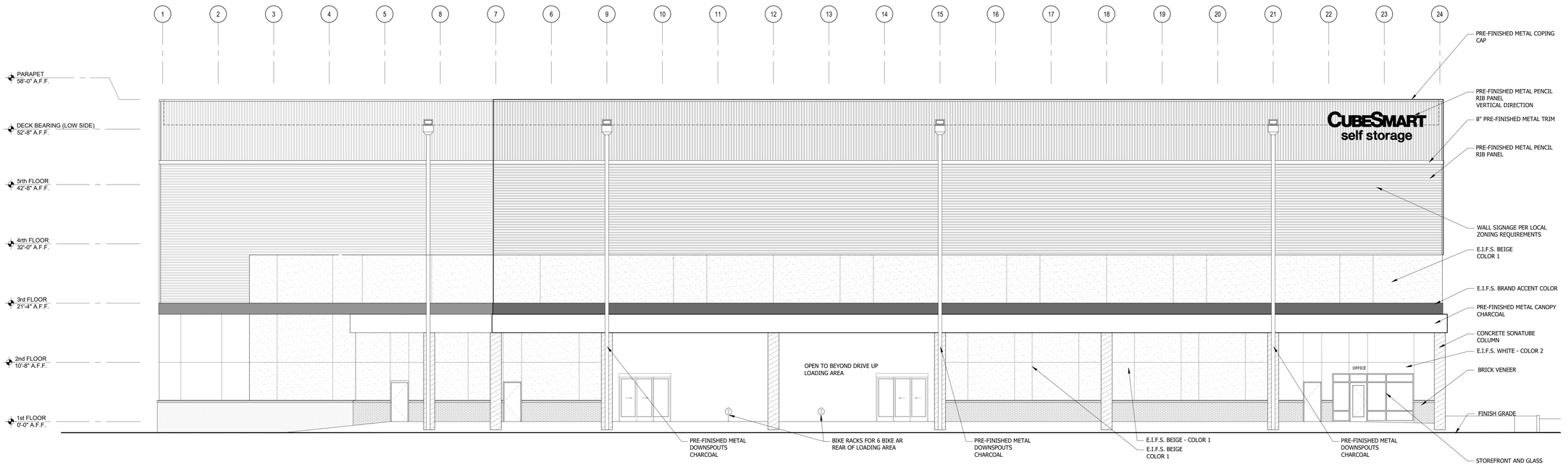
A-201

Copyright 2021 Michael Parker Studios PLLC



2 ELEVATION - SOUTH

scale: 1/8"=1'-0"



1 ELEVATION - EAST

scale: 1/8"=1'-0"

michael parker
studios
pllc.

13755 thompson place drive
mint hill, nc 28227
704-578-2851

PREMIER STORAGE INVESTORS

SELF STORAGE

ARLINGTON, MASSACHUSETTS
Project No. 21-033

REGISTERED ARCHITECT
JAY MICHAEL BRITT
No. 36511
MINT HILL
NC
COMMONWEALTH OF MASSACHUSETTS

02/09/22

Local Approvals Submission
February 09, 2022

REVISIONS

No.	Description	Date

EXTERIOR ELEVATIONS

A-202

Copyright 2021 Michael Parker Studios PLLC

STORMWATER REPORT

Proposed Self-Storage Facility

34 Dudley Street, Arlington, MA

PREPARED FOR

PSI Atlantic Arlington MA, LLC
530 Oak Court Drive
Suite 155
Memphis, TN 38117

PREPARED BY

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

February 2022

Table of Contents

Checklist for Stormwater Report

Stormwater Report Narrative **3**

Project Description 3
Site Description 3
Existing Drainage Conditions 4
Proposed Drainage Conditions 5
Environmentally Sensitive and Low Impact Development (LID) Techniques 5

Regulatory Compliance **11**

Massachusetts Department of Environmental Protection (DEP) – Stormwater Management Standards 11
Standard 1: No New Untreated Discharges or Erosion to Wetlands 11
Standard 2: Peak Rate Attenuation 11
Standard 3: Stormwater Recharge 12
Standard 4: Water Quality 12
Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs) 13
Standard 6: Critical Areas 13
Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable 13
Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls 13
Standard 9: Operation and Maintenance Plan 13
Standard 10: Prohibition of Illicit Discharges 13
Local Municipal Rules and Regulations 13

Appendices

Appendix A: Standard 1 Computations and Supporting Information A-1
Appendix B: Standard 2 Computations and Supporting Information B-1
Appendix C: Standard 3 Computations and Supporting Documentation C-1
Appendix D: Standard 4 Computations and Supporting Information D-1
Appendix E: Standard 7 Supporting Information E-1
Appendix F: Standard 8 Supporting Information F-1

List of Tables

Table No.	Description	Page
Table 1	Existing Conditions Hydrologic Data	4
Table 2	Existing Conditions Hydrologic Data	5
Table 3	Proposed Conditions Hydrologic Data	5
Table 4	Peak Discharge Rates (cfs*)	12
Table 4	Stormwater Volume Analysis (cfs*)	**Error! Bookmark not defined.**
Table 5	Summary of Recharge Calculations	12

Project Benefits

Enhance Water Quality

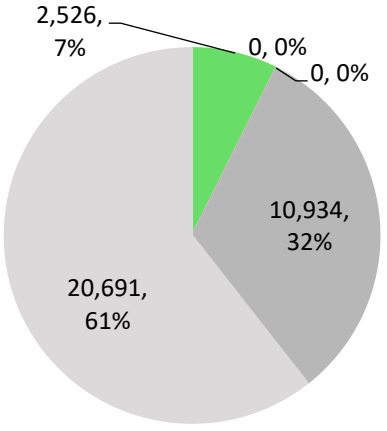
- Exceeds treatment standards set forth in MS4, TMDL, and Massachusetts Stormwater Standards
  - **60%** Phosphrous removal
  - **>80%** TSS removal
- Improvement of water quality for human health and ecological function
- LID features such as bioretention and an reduction of impervious areas

Peak Rate (and Volume) Attenuation

- Proposed 10 year storm flow rates are less than existing 2 year storm flow rates
- **312%** increase in pervious area on site
- Reduction in stormwater volume by incorporating a bioretention basin and subsurface infiltration basin

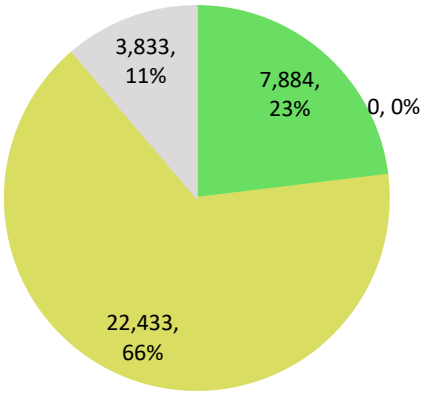
Protect Natural Resources

- Reduction of impervious surface in Riverfront Area
- Stabilization of existing, unstable slope
- Enhancement of upland vegetated transitions
- Enhance wildlife habitat
- Landscaping to include native species promoted by the Conservation Commission



Existing Conditions Areas (SF)





Proposed Conditions Areas (SF)

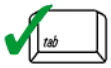
Checklist for Stormwater Report

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.





A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

---

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



2/9/2022

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☒ Static ☐ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☒ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☐ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

☐ Limited Project

☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.

☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area

☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff

☐ Bike Path and/or Foot Path

☒ Redevelopment Project

☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☒ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☐ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☐ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☐ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

Stormwater Report Narrative

This Stormwater Report has been prepared to demonstrate compliance with the Massachusetts Stormwater Management Standards in accordance with the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00) and Water Quality Certification Regulations (314 CMR 9.00). This report also demonstrates compliance with the Town of Arlington Stormwater Management Standards.

Project Description

The Applicant, PSI Atlantic Arlington MA, LLC, is proposing to construct a Self-Storage redevelopment (the Project). As proposed, the Project consists of 95,706 square feet of building space, ancillary landscape improvements, parking spaces (11), and stormwater management and utility improvements to support this use.

The Project will entail the construction of a five story self-storage facility with associated parking and is not considered a Land Use with Higher Potential Pollutant Loads (LUHPPL).

Site Description

The Project Site is a 0.78-acre parcel of land (the Site) located within the Industrial zoning district at 34 Dudley Street in Arlington, Massachusetts (see Figure 1). The Site lies within the surface watershed of Mill Brook and is bounded by Dudley Street to the north, Mill Brook to the south, and commercial and residential uses to the east and west. See Figure 1, Site Locus Map.

Wetland Resource Areas on the Site include the following:

The resource areas identified on or near the Project Site subject to state regulations under the WPA include Bank and Riverfront Area. The resource areas are defined under the WPA (310 CMR 10.00) as follows:

- **Bank**: As defined at 310 CMR 10.54 (2), *"a Bank is the portion of the land surface which normally abuts and confines a water body … The upper boundary of Bank is the first observable break in slope or the mean annual flood level, whichever is lower."*
- **RA:** As defined by 310 CMR 10.58 (2)(a)(3), Riverfront Area is *"the area of land between a river's mean annual high-water line measured horizontally outward from the river and a parallel line located 200 feet away…"*

An additional resource area established under the Bylaw is the 100-foot adjacent upland resource area. For the purposes of this NOI, the URA has been broken down into separate buffer zones. These areas are defined as follows:

- 25-foot No Disturb Zone (NDZ) – the innermost 25 feet of the 100-foot URA
- 50-foot No Build Zone (NBZ) – the inner 50 feet of the 100-foot URA
- 100-foot URA – land within 100 feet of a resource area

Wetlands and their buffer zones on/adjacent to the property are described in more detail in the Notice of Intent narrative, bound separately.

Table 1 Existing Conditions Hydrologic Data

Name	Critical Area (yes/no)	Zone 1 or Zone A (yes/no)	ORW or SRW (yes/no)	Zone II or IWPA (yes/no)	Other
Mill Brook	No	No	No	No	*Impaired Waterbody (MA71-07)* *Benthic Macroinvertebrates* *Escherichia Coli (E. Coli)N/A*

According to the National Resources Conservation Service (NRCS), surface soils on the Site include Merrimac-Urban land complex and Udorthents. On-site soils are classified as Hydrologic Soil Groups (HSG D) . To support the redevelopment and in accordance with the Town of Arlington Inland Wetland District, a subsurface geotechnical investigation was performed by GeoEngineers, Inc, Boston, MA, and advanced borings in monitoring wells in December 2021 and January 2022. The results of the soil boring analysis, the soils on the site are classified as HSG A soils with an infiltration rate of 2.4 inches per hour. The Geotechnical Report is included in Appendix C, the Site is not considered to be within an area of rapid infiltration (soils with a saturated hydraulic conductivity greater than 2.4 inches per hour).

Existing Drainage Conditions

Under existing conditions, the Site is developed and predominately impervious with generally flat topography. Just to the south of the southerly property boundary, there is a steep slope down to Mill Brook. Figure 2 illustrates the existing drainage patterns on the Site. Currently, the Site is divided into two drainage areas as stormwater runoff flows to two Design Points, which have been identified as Dudley Street (DP-1) and Mill Brook (DP-2). Table 2 below provides a summary of the existing conditions hydrologic data.

Table 2 Existing Conditions Hydrologic Data

Drainage Area	Discharge Location	Design Point	Area (Acres)	Curve Number	Time of Concentration (min)
EX-1	Dudley Street	DP-1	0.325	97	5.0
EX-2	Mill Brook	DP-2	0.459	96	5.0

Proposed Drainage Conditions

Figure 3 illustrates the proposed "post construction" drainage conditions for the project. As shown, the Site will be divided into 5 drainage areas that discharge treated stormwater to the 2 existing Design Points. Table 3 below provides a summary of the proposed conditions hydrologic data.

Table 3 Proposed Conditions Hydrologic Data

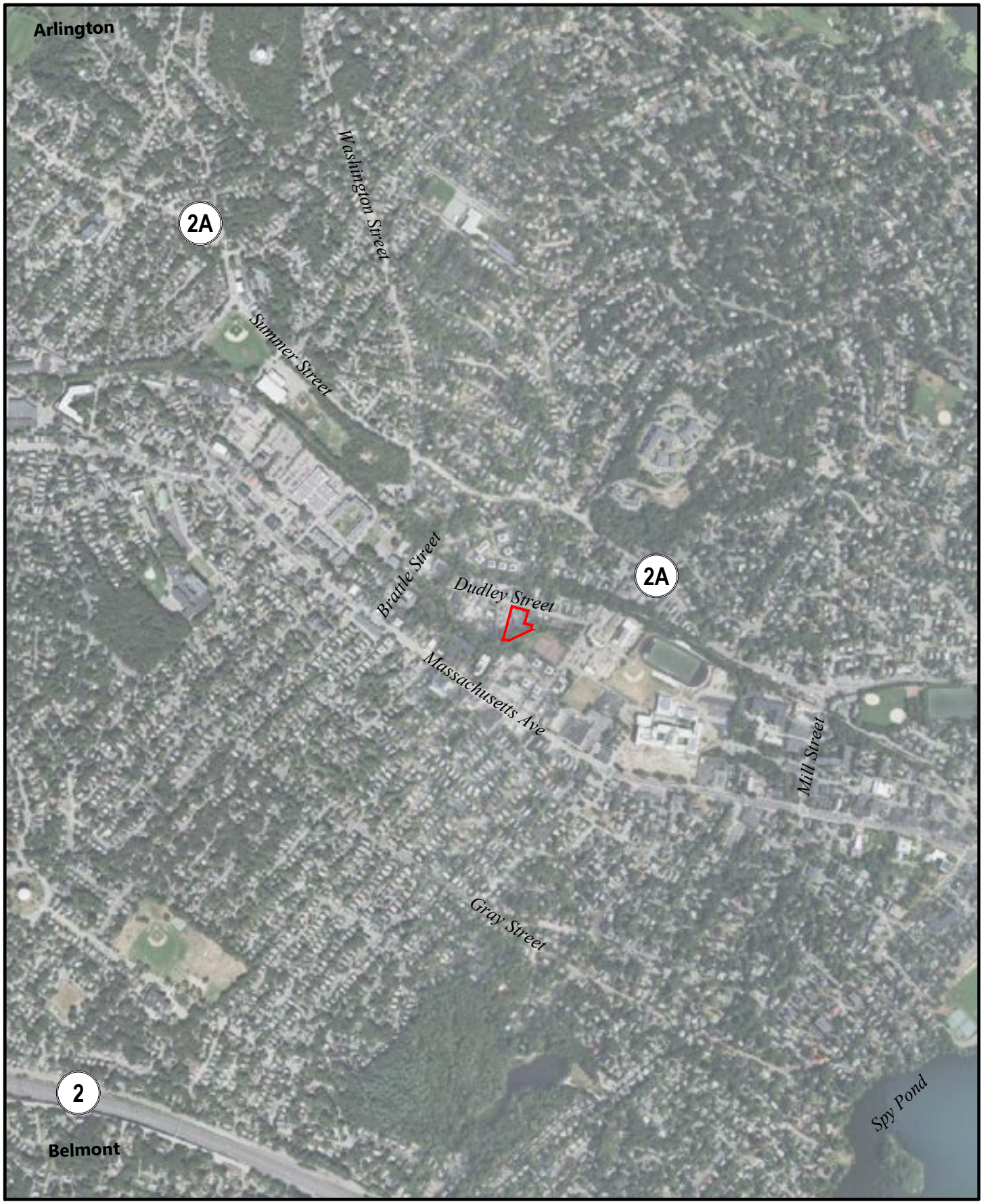
Drainage Area	Discharge Location	Design Point	Area (Acres)	Curve Number	Time of Concentration (min)
PR-1	Mill Brook	DP-2	0.515	98	5.0
PR-2	Mill Brook	DP-2	0.157	80	5.0
PR-3	Mill Brook	DP-2	0.009	96	5.0
PR-4	Mill Brook	DP-2	0.066	98	5.0
PR-5	Dudley Street	DP-1	0.036	87	5.0

The site design integrates a comprehensive stormwater management system that has been developed in accordance with the Massachusetts Stormwater Handbook. The proposed stormwater management system has been designed to treat the half inch Water Quality Volume.

Environmentally Sensitive and Low Impact Development (LID) Techniques

Low Impact Development (LID) techniques and stormwater Best Management Practices (BMPs) implemented into the site design include reduction of impervious area, minimized disturbance to existing trees and vegetation, a bioretention basin, . The bioretention basin has been incorporated, as recommended by the Zoning Bylaws, to collect stormwater from the parking area. In general, stormwater from the proposed impervious surfaces is collected in a bioretention basin or deep sump hooded catch basins, prior to being discharged into a subsurface infiltration basin with an isolator row. The deep sump hooded catch basin and isolator row provide pretreatment prior to final treatment by the infiltration basin. Additionally,

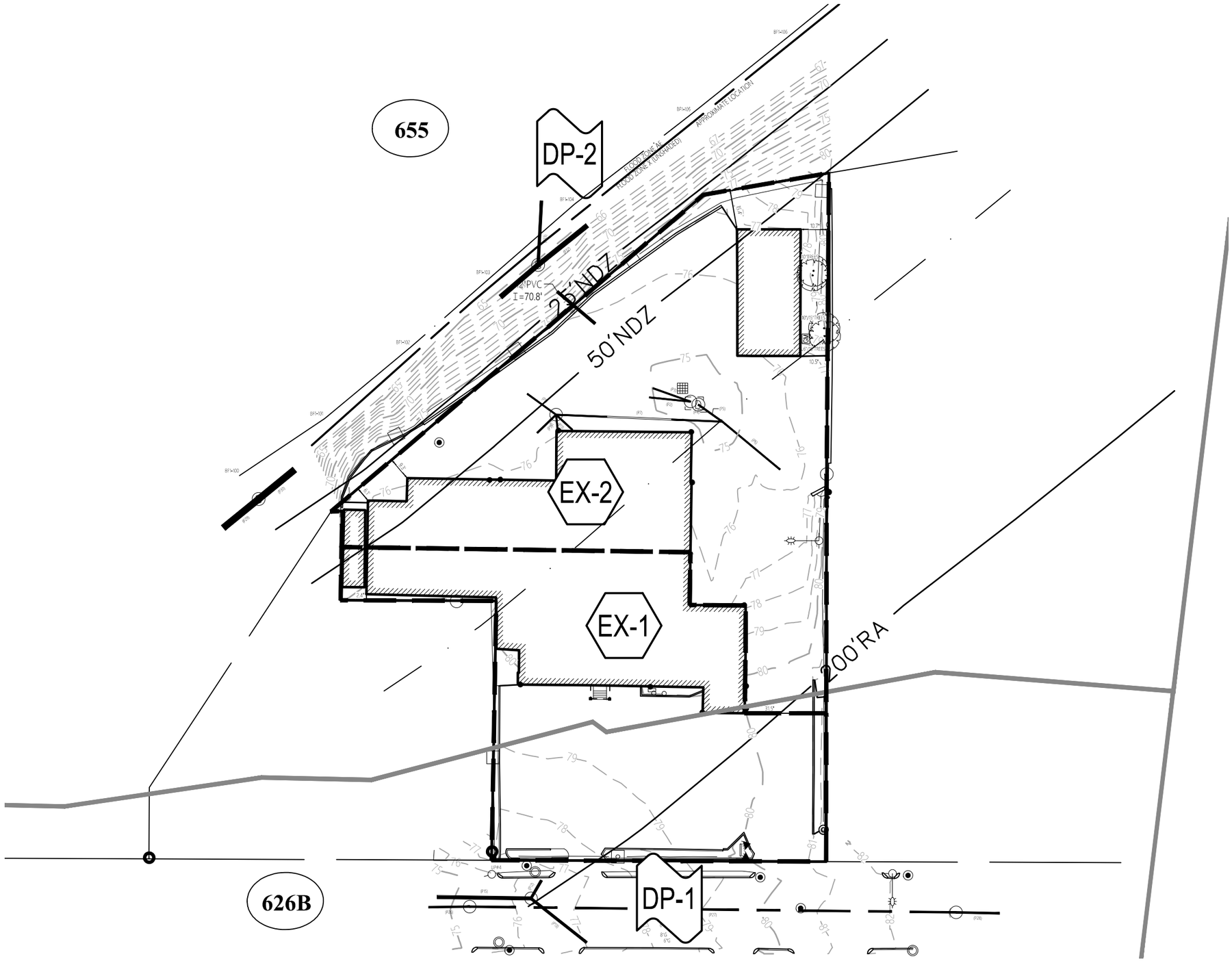
the bioretention basin has a sediment forebay for pretreatment prior to final treatment by the bioretention basin soil media. The overflow from the bioretention basin is connected to the larger subsurface infiltration basin to control larger storm events and provide additional water quality benefits. The subsurface infiltration basin has an outlet control structure to control the rates of flow and ensure proper water quality volume, prior to discharging to the existing pipe discharge to the south of the property towards Mill Brook.



0 500 1000 2000 Feet

Site Location Map
DEP Permitting
Arlington Self Storage Facility
Arlington, MA

Figure 1



Legend

SYMBOLS

- X — **DESIGN POINT**
- X — **DRAINAGE AREA DESIGNATION**
- X — **POND**

LINETYPES

- **DRAINAGE AREA BOUNDARY**
- **TIME OF CONCENTRATION FLOW LINE**
- **SOIL TYPE BOUNDARY**
- **100' BUFFER ZONE**
- 4–220 4–219 — **WETLAND BOUNDARY**

SCS SOIL CLASSIFICATIONS

- 626B — **MERRIMAC-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES, HSG A**
- 655 — **UDORTHENTS, WET SUBSTRATUM**

0 20 40 80 Feet

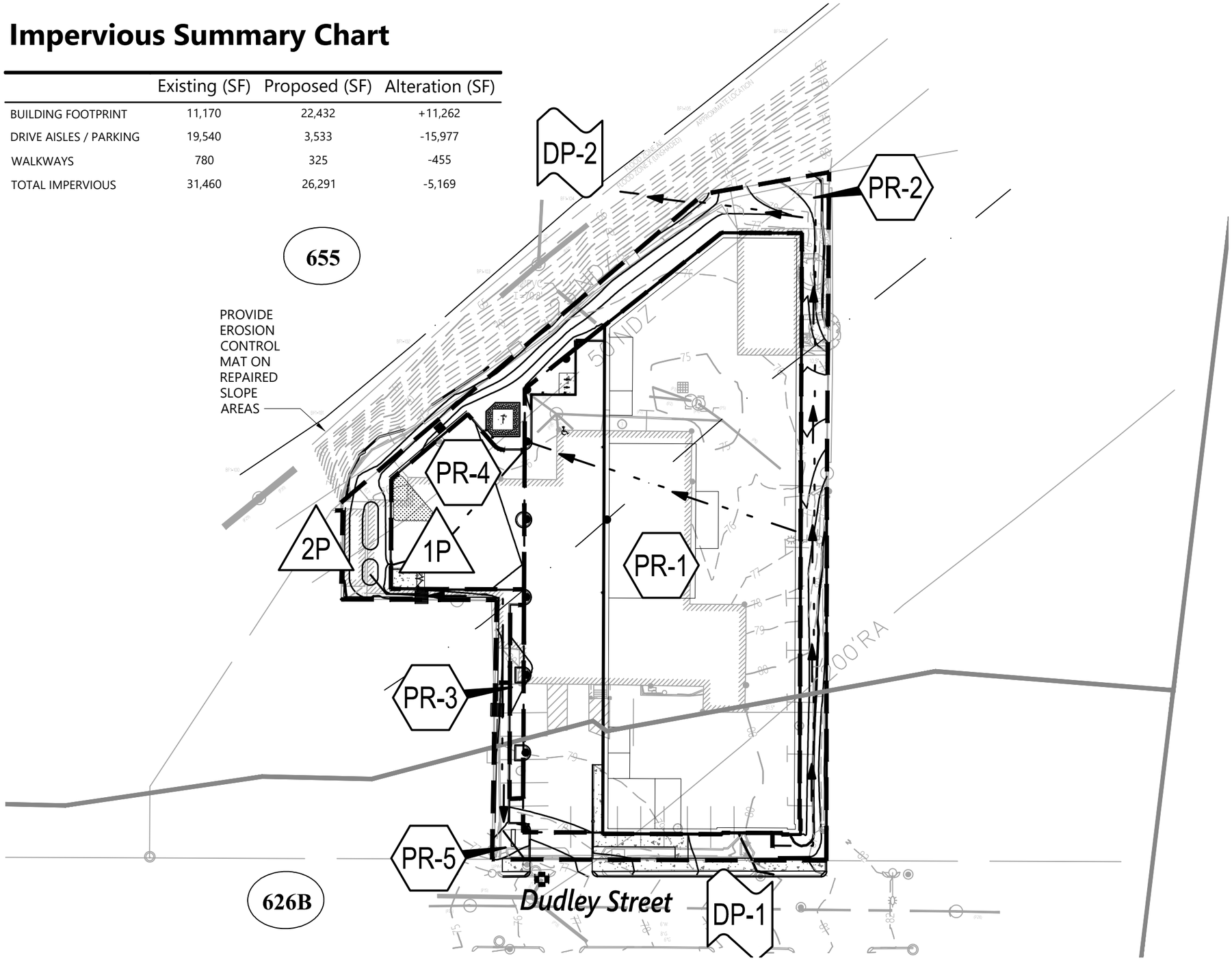
Existing Drainage Conditions — **Figure 2**

Proposed Self Storage Facility
Arlington, Massachusetts

02/09/2022

Impervious Summary Chart

	Existing (SF)	Proposed (SF)	Alteration (SF)
BUILDING FOOTPRINT	11,170	22,432	+11,262
DRIVE AISLES / PARKING	19,540	3,533	-15,977
WALKWAYS	780	325	-455
TOTAL IMPERVIOUS	31,460	26,291	-5,169



Legend

SYMBOLS

- X — **DESIGN POINT**
- X — **DRAINAGE AREA DESIGNATION**
- X — **POND**

LINETYPES

- **DRAINAGE AREA BOUNDARY**
- **TIME OF CONCENTRATION FLOW LINE**
- **SOIL TYPE BOUNDARY**
- **100' BUFFER ZONE**
- 4–220 4–219 — **WETLAND BOUNDARY**

SCS SOIL CLASSIFICATIONS

- 626B — **MERRIMAC-URBAN LAND COMPLEX, 0 TO 8 PERCENT SLOPES, HSG A**
- 655 — **UDORTHENTS, WET SUBSTRATUM**

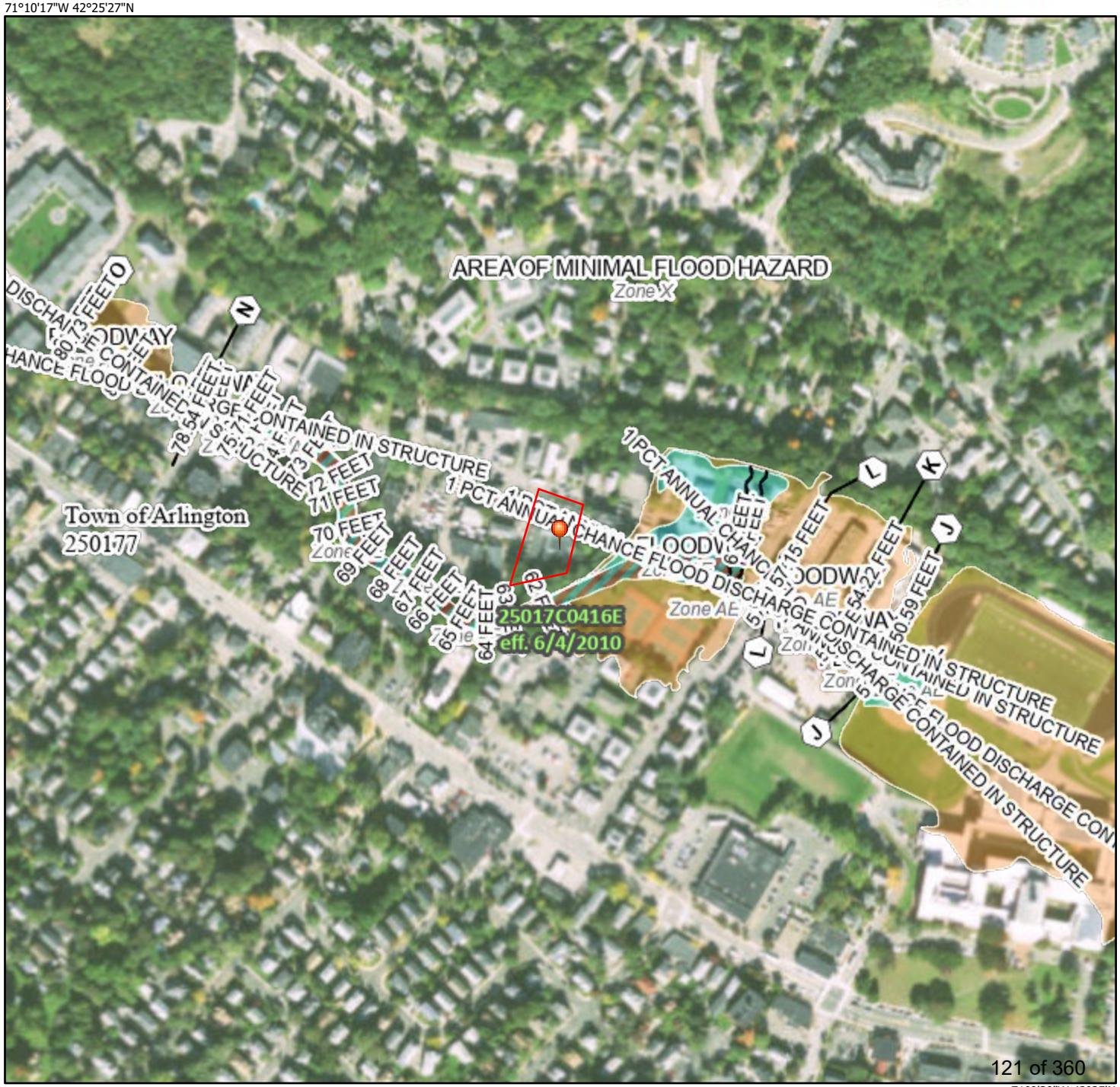
0 20 40 80 Feet

Proposed Drainage Conditions — **Figure 3**

Proposed Self Storage Facility
Arlington, Massachusetts

02/09/2022

National Flood Hazard Layer FIRMette



0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 2/9/2022 at 10:06 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

FIGURE 4

This page intentionally left blank.

Regulatory Compliance

Massachusetts Department of Environmental Protection (DEP) – Stormwater Management Standards

As demonstrated below, the proposed Project fully complies with the DEP Stormwater Management Standards.

Standard 1: No New Untreated Discharges or Erosion to Wetlands

The Project has been designed to comply with Standard 1.

The Best Management Practices (BMPs) included in the proposed stormwater management system have been designed in accordance with the Massachusetts Stormwater Handbook. Supporting information and computations demonstrating that no new untreated discharges will result from the Project are presented through compliance with Standards 4 through 6.

All proposed Project stormwater outlets and conveyances have been designed to not cause erosion or scour to wetlands or receiving waters. Outlets from closed drainage systems have been designed with flared end sections and stone protection to dissipate discharge velocities.

Computations and supporting information for the sizing and selection of materials used to protect from scour and erosion are included in Appendix A.

Standard 2: Peak Rate Attenuation

The Project has been designed to comply with Standard 2.

The rainfall-runoff response of the Site under existing and proposed conditions was analyzed for storm events with recurrence intervals of 2, 10, 25 and 100 years. The results of the analysis, as summarized in Table 4 below, indicate that there is no increase in peak discharge rates between the existing and proposed conditions.

Computations and supporting information regarding the hydrologic modeling are included in Appendix B.

Table 4 Peak Discharge Rates (cfs*)

Design Point	2-year	10-year	25-year	100-year
Design Point: Dudley Street (DP-1)				
Existing	1.05	1.68	2.08	2.68
Proposed	0.08	0.15	0.20	0.27
Design Point: Mill Brook (DP-2)				
Existing	1.46	2.36	2.93	3.78
Proposed	0.56	1.45	2.46	3.67

Standard 3: Stormwater Recharge

The Project has been designed to comply with Standard 3.

In accordance with the Stormwater Handbook, the Required Recharge Volume for the Project is 1,315 cubic feet.

Recharge of stormwater has been provided through the use of a bioretention basin and subsurface infiltration basin, which have been sized using the Static method. Each infiltration BMP has been designed to drain completely within 72 hours. Table 5 below provides a summary of the proposed infiltration BMPs utilized for the Project.

Table 5 Summary of Recharge Calculations

Infiltration BMP	Provided Recharge Volume (cubic feet)
Subsurface Infiltration Basin	1,954
Total Provided Recharge	**1,954**
Total Required Recharge	**1,315**

Geotechnical Engineering Report, computations, and supporting information are included in Appendix C.

Standard 4: Water Quality

The Project has been designed to comply with Standard 4.

The proposed stormwater management system implements a treatment train of BMPs that has been designed to provide 80% TSS removal of stormwater runoff from all proposed impervious surfaces.

Computations and supporting information, including the Long-Term Pollution Prevention Plan, are included in Appendix D.

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

The Project is not considered a LUHPPL.

Standard 6: Critical Areas

The Project will not discharge stormwater near or to a critical area.

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the Maximum Extent Practicable

The Project has been designed to comply with all ten of the Stormwater Management Standards.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Controls

The Project will disturb approximately 0.8 acres of land and is not required to obtain coverage under the Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit. In lieu of the Stormwater Pollution Prevention Plan (SWPPP) required under NPDES, a Construction Period Pollution Prevention and Erosion Sedimentation Control Plan has been included in Appendix F.

Standard 9: Operation and Maintenance Plan

In compliance with Standard 9, a Post Construction Stormwater Operation and Maintenance (O&M) Plan has been developed for the Project. The O&M Plan is included in Appendix D as part of the Long Term Pollution Prevention Plan.

Standard 10: Prohibition of Illicit Discharges

Sanitary sewer and storm drainage structures which were part of the previous development on this site are to be completely removed during the site redevelopment. The design plans submitted with this report have been designed in full compliance with current standards. The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges.

Local Municipal Rules and Regulations

The following document intended to assist applicants and their consultants by providing Stormwater Management/Mitigation design guidelines, submission requirements, and review procedures in accordance with The Town of Arlington By-Law Title V, Article 15, Section 4.

The design and function of the stormwater drainage system shall conform to the following requirements, which may be modified by the Town of Arlington in a case-by-case situation to better suit the problems and specific needs of a particular site:

1. *All projects subject to this By-Law must meet the standards of the most current Massachusetts Department of Environmental Protection (DEP) Stormwater Management Policy and any applicable By-Laws and/or Rules and Regulations of the Town of Arlington.*

   The Project, as currently designed and demonstrated by this stormwater management plan and report, fully complies with the DEP Stormwater management Policy and Town of Arlington regulations.

2. *No project shall result in an increase in the peak rate of stormwater runoff or volume over natural and existing conditions for the 2-, 10-, and 25-Year 24-hour duration storm events.*

   Project complies, refer to Table 4.

3. Technical design and construction standards for detention/retention/infiltration structures, including, but not limited to, groundwater separation, outlet control structures, sediment forebays, spillways, splashpads, as well as sizing for any basins, outlets, and spillways shall be consistent with DEP Stormwater Management Standards.

   Project complies, refer to the Site Plans for the design and details for the stormwater management structures, which are consistent with the DEP Stormwater Management Standards.

4. *The design for the capacity of all stormwater system pipes and inlet grates shall be based on a Rational Method Analysis (or acceptable equivalent) for a 25-Year Storm intensity.*

   The closed drainage system has been designed to adequately convey the 25-year storm event. Refer to Appendix G for the hydraulic capacity spreadsheet for the pipe network.

5. *Existing lot grading shall be retained wherever possible to maintain predevelopment drainage patterns to the greatest extent possible. Where grading must be altered, the proposed grading shall not convey additional overland flows across lot lines or cause ponding on any adjacent property.*

   The project has been designed to mimic existing hydrologic drainage patterns. Stormwater management best management practices have been incorporated to provide water quality treatment and water quality control to ensure additional stormwater is not conveyed across lot lines or cause ponding on adjacent properties.

All projects to which the above referenced Town by-law applies, shall submit to the Engineering Division a Grading & Drainage Report and/or Plan at a minimum scale of 1"=40'. The Plans and/or Report shall consist of and include the following information (if applicable):

1. *The Name, Mailing Address, Phone Number, and Email of the Property Owner, Land Developer, and the Engineer or Consultant working on the Project.*
2. *Delineation of:*
   a. *Federal, State, and/or Local Wetlands.*
   b. *The National Flood Insurance Program 100-Year Flood Zone and/or other Risk Areas.*
   c. *Any Streams and/or Drainage Ways on or abutting the Site.*
   d. *Any Easements or Right-of-Ways on or abutting the Site.*
   e. *Extents of the Project or a Limit of Work/Disturbance Area.*

3. *Existing and proposed contours on the site to indicate general topography. The contour interval shall be at a two- foot interval. Spot elevations shall be included in areas with grades of 2% or less. If permanent benchmarks are required for the proposed activities, those shall also be shown on the Plan.*
   a. *Approximate existing contour lines that are appropriate for use in certain small-scale projects can be found on the Town of Arlington website at http://209.6.3.218/GISMaps//index1.htm.*
4. *Existing and proposed impervious surfaces shall be clearly delineated and labeled on the plan. Include a summary table of all features, both existing and proposed. An example summary table is shown below:*

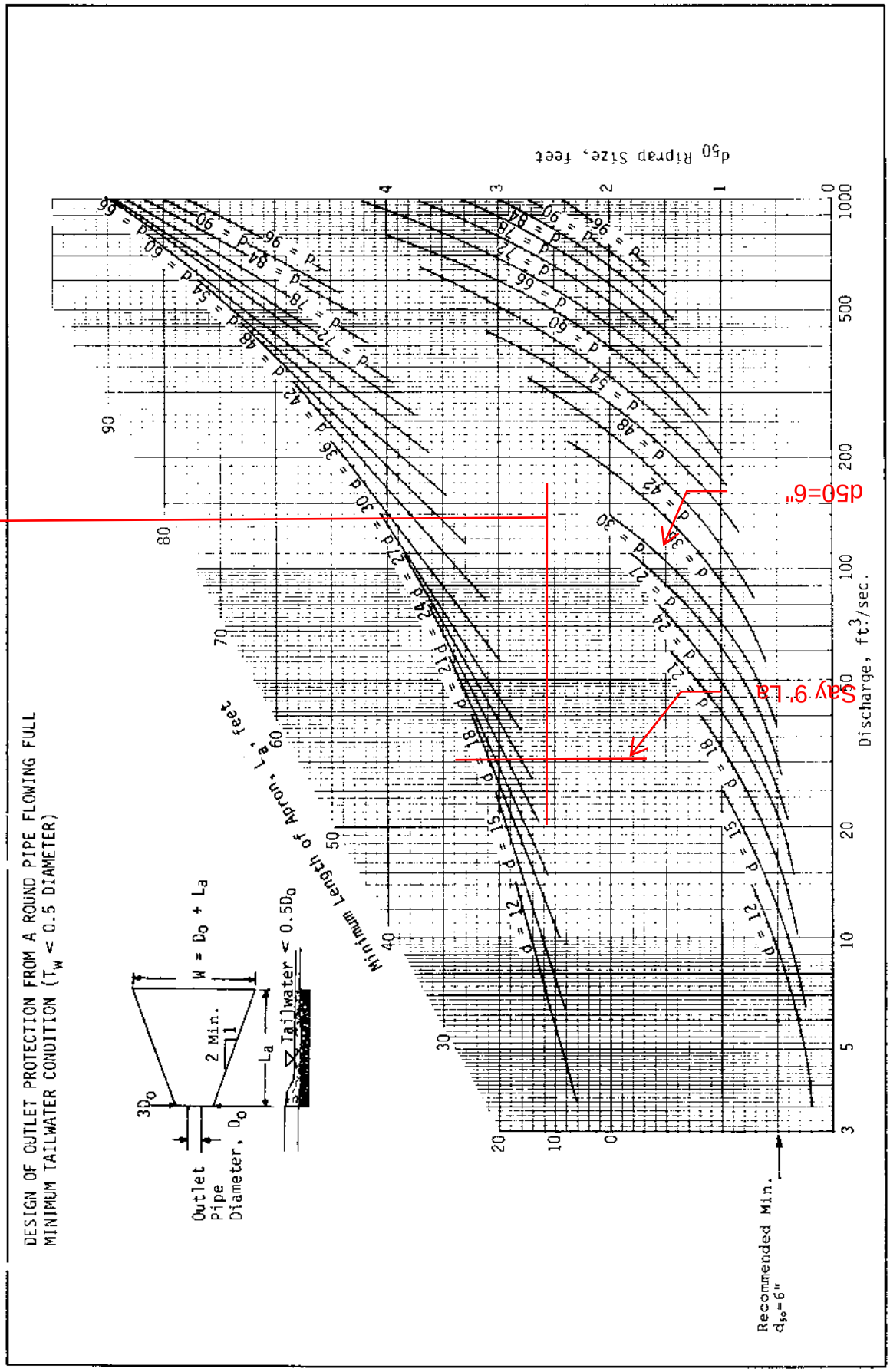
	Existing (SF)	***Proposed (SF)***	***Alteration***
Building Footprint	*1,250*	*1,500*	*+ 250 SF*
Bituminous Driveway	*500*	*650*	*+ 150 SF*
Concrete Walkway	*40*	*30*	*- 10 SF*
Total Impervious	***1,790***	***2,180***	***+ 390 SF***

5. *Existing and Proposed locations of all drainage structures, including foundation and roof drains, with rim and invert elevations. Profile and/or Cross Section drawings shall be provided for all proposed infiltration/retention/detention systems.*
6. *Where stormwater recharge or infiltration is proposed, the plans shall include observed and estimated maximum groundwater elevations at the location of each proposed infiltration/retention/detention area.*
   a. *Soil percolation testing or other acceptable soil absorption rate testing should be conducted in the vicinity of any proposed infiltration/retention/detention area.*
7. *Location and detail of proposed erosion & sediment control measures to be installed and maintained during construction activities.*
8. *Hydrologic calculations and a summary table showing the pre- and post-development runoff conditions for comparative purposes. Runoff calculations shall be prepared for the 2-, 10-, 25-, and 100-Year storm events for both the Existing and Proposed Conditions. These drainage calculations shall be prepared by utilizing the NRCS TR55 or TR20 Method.*
   a. *With a written request from the applicant, and at the full discretion of the Town of Arlington Engineering Division, certain small-scale projects may adequately demonstrate through simple runoff/storage calculations that the proposed stormwater mitigation is appropriate.*

9. The project has incorporated the requirements of the stormwater management plans and drainage report, as demonstrated by the technical analysis included in this report and Site Plans

Appendix A: Standard 1 Computations and Supporting Information

- Outlet Protection Sizing Calculation
- Pipe Sizing Calculations



Source: USDA-SCS Plate 3.18-3

Pipe Sizing Calculations

The closed drainage system was designed for the 25-year storm event, in accordance with the Town's by-laws.

Drainage pipes were sized using Manning's Equation for full-flow capacity and the Rational Method. Additionally, the performance of the system was analyzed using StormCAD, a HEC-22 based program.

Pipe Sizing Calculations

Project	Proposed Self Storage Facility Arlington, MA	**Project #**	52816.00
Calculated by	MEA	**Date**	2/9/2022
Checked by		**Date**	

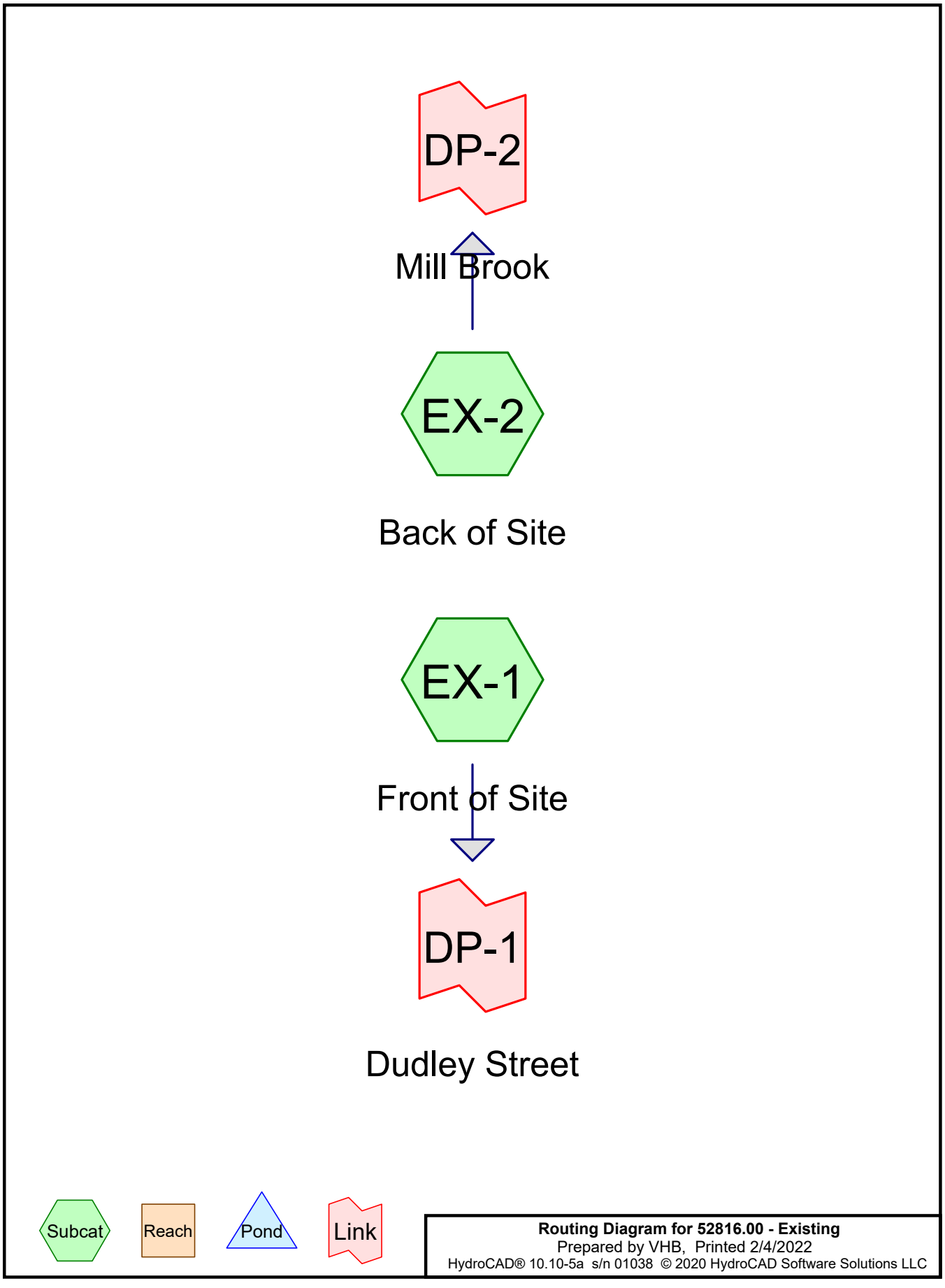
Start Node	Stop Node	Upstream Inlet Area	Upstream Inlet C	System CA	Time of Conc.	Intensity	Pipe Size	Material	Manning's "n"	Slope	Length	Capacity (Full Flow)	Flow (Design)	Velocity (Average)	Rim (Upper)	Hydraulic Grade Line In	Rim (Lower)	Hydraulic Grade Line Out	Invert (Upper)	Invert (Lower)
-	-	(acres)	-	(acres)	(min)	(in/hr)	(in)	-	-	(ft/ft)	(ft)	(cfs)	(cfs)	(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
101 (DRAIN)	Mill Brook	(N/A)	(N/A)	0.012	7.14	7.41	12	HDPE Pipe	0.013	0.015	13.6	4.32	1.21	4.72	77.52	71.46	0.00	71.17	71.00	70.80
108 (AD)	112 (AD)	0.03	0.2	0.006	5.00	8.47	8	HDPE Pipe	0.013	0.017	110.1	1.59	0.05	2.09	78.53	75.60	76.58	73.68	75.50	73.60
112 (AD)	110 (DRAIN)	0.031	0.2	0.012	5.88	8.04	8	HDPE Pipe	0.013	0.017	72.2	1.56	0.10	2.50	76.58	73.64	78.34	72.41	73.50	72.30
110 (DRAIN)	111 (DRAIN)	(N/A)	(N/A)	0.012	6.36	7.80	8	HDPE Pipe	0.013	0.011	36.3	1.27	0.10	2.15	78.34	72.34	78.11	71.92	72.20	71.80
111 (DRAIN)	101 (DRAIN)	(N/A)	(N/A)	0.012	6.64	7.66	8	HDPE Pipe	0.013	0.010	61.4	1.19	0.10	2.05	78.11	71.84	77.52	71.46	71.70	71.10
MH-1	107	(N/A)	(N/A)	0.263	5.11	8.41	12	HDPE Pipe	0.013	0.014	14.6	4.17	2.23	5.40	76.40	75.64	78.06	75.34	75.00	74.80
102 (DRAIN)	Isolator Row	(N/A)	(N/A)	0.209	5.22	8.36	12	HDPE Pipe	0.013	0.012	7.4	3.98	2.18	5.18	77.94	70.53	75.05	70.42	69.90	69.85
103 (DRAIN)	102 (DRAIN)	(N/A)	(N/A)	0.000	0.08	8.47	12	HDPE Pipe	0.013	0.018	37.9	4.84	0.42	3.78	77.19	72.97	77.94	72.20	72.70	72.00
BEND	102 (DRAIN)	(N/A)	(N/A)	0.200	5.18	8.38	12	HDPE Pipe	0.013	0.017	11.5	4.70	1.69	5.50	76.51	75.55	77.94	75.24	75.00	74.80
104	102 (DRAIN)	0.009	0.9	0.008	5.00	8.47	12	HDPE Pipe	0.013	0.025	32.6	5.58	0.07	2.43	77.87	74.71	77.94	73.88	74.60	73.80
100 (DRAIN)	101 (DRAIN)	(N/A)	(N/A)	0.000	0.05	8.47	12	HDPE Pipe	0.013	0.005	85.4	2.44	1.12	3.04	77.49	71.98	77.52	71.55	71.50	71.10
STORMTECH	100 (DRAIN)	(N/A)	(N/A)	0.000	0.00	8.47	12	HDPE Pipe	0.013	0.012	8.7	3.98	1.12	1.43	75.05	71.98	77.49	71.98	69.85	69.80
106 (AD)	103 (DRAIN)	(N/A)	(N/A)	0.000	0.00	8.47	12	HDPE Pipe	0.013	0.024	18.7	5.53	0.42	4.16	76.25	73.52	77.19	72.99	73.25	72.80
RD	BEND	0.223	0.9	0.200	5.00	8.47	12	HDPE Pipe	0.013	0.017	60.0	4.60	1.71	5.42	76.88	76.56	76.51	75.42	76.00	75.00
RD	MH-1	0.106	0.9	0.095	5.00	8.47	8	HDPE Pipe	0.013	0.023	34.6	1.84	0.81	5.10	79.30	76.23	76.40	75.64	75.80	75.00
RD	MH-1	0.186	0.9	0.167	5.00	8.47	12	HDPE Pipe	0.013	0.043	10.3	7.36	1.43	7.26	78.87	75.71	76.40	75.64	75.20	75.00

Appendix B: Standard 2 Computations and Supporting Information

The rainfall-runoff response of the Site under existing and proposed conditions was evaluated for storm events with recurrence intervals of 2, 10, 25 and 100-years. Rainfall volumes used for this analysis were based on the Natural Resources Conservation Service (NRCS) Type III, 24-hour storm and NOAA Atlas 14 precipitation depths for the site: 3.27, 5.16, 6.35, and 8.16 inches, respectively. Runoff coefficients for the pre- and post-development conditions, as previously shown in Tables 2 and 3 respectively, were determined using NRCS Technical Release 55 (TR-55) methodology as provided in HydroCAD. Drainage areas used in the analyses were described in previous sections and shown on Figures 2 and 3. The HydroCAD model is based on the NRCS Technical Release 20 (TR-20) Model for Project Formulation Hydrology.

HydroCAD Analysis: Existing Conditions

2-Year Storm Event – Existing



Routing Diagram for 52816.00 - Existing
Prepared by VHB, Printed 2/4/2022
HydroCAD® 10.10-5a s/n 01038 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.27	2
2	10-year	Type III 24-hr		Default	24.00	1	5.16	2
3	25-year	Type III 24-hr		Default	24.00	1	6.35	2
4	100-year	Type III 24-hr		Default	24.00	1	8.16	2

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.017	89	<50% Grass cover, Poor, HSG D (EX-1, EX-2)
0.003	80	>75% Grass cover, Good, HSG D (EX-1)
0.475	98	Paved parking, HSG D (EX-1, EX-2)
0.251	98	Roofs, HSG D (EX-1, EX-2)
0.038	79	Woods, Fair, HSG D (EX-2)
0.783	**97**	**TOTAL AREA**

52816.00 - Existing
Prepared by VHB
Printed 2/4/2022
HydroCAD® 10.10-5a s/n 01038 © 2020 HydroCAD Software Solutions LLC

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.017	0.000	0.017	<50% Grass cover, Poor	EX-1, EX-2
0.000	0.000	0.000	0.003	0.000	0.003	>75% Grass cover, Good	EX-1
0.000	0.000	0.000	0.475	0.000	0.475	Paved parking	EX-1, EX-2
0.000	0.000	0.000	0.251	0.000	0.251	Roofs	EX-1, EX-2
0.000	0.000	0.000	0.038	0.000	0.038	Woods, Fair	EX-2
0.000	**0.000**	**0.000**	**0.783**	**0.000**	**0.783**	**TOTAL AREA**	

Summary for Subcatchment EX-1: Front of Site

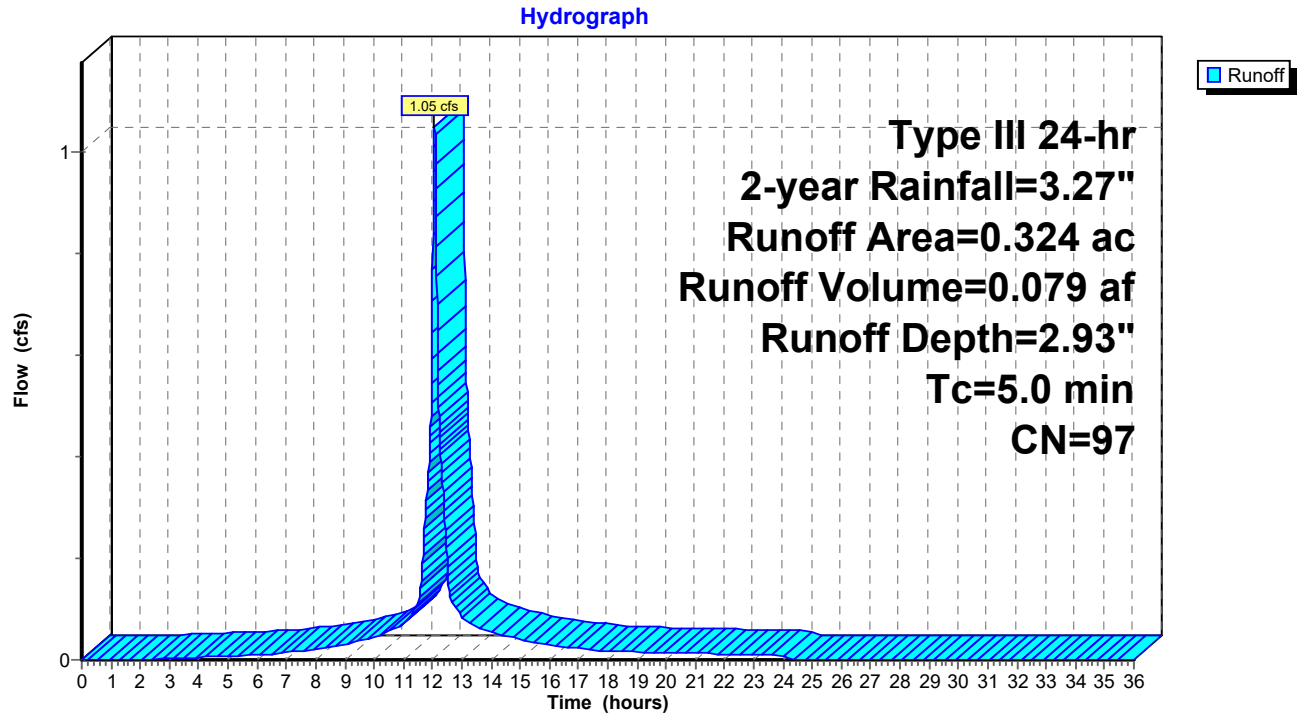
Runoff = 1.05 cfs @ 12.07 hrs, Volume= 0.079 af, Depth= 2.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.016	89	<50% Grass cover, Poor, HSG D
0.003	80	>75% Grass cover, Good, HSG D
0.179	98	Paved parking, HSG D
0.127	98	Roofs, HSG D
0.324	97	Weighted Average
0.019		5.74% Pervious Area
0.305		94.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-1: Front of Site



Summary for Subcatchment EX-2: Back of Site

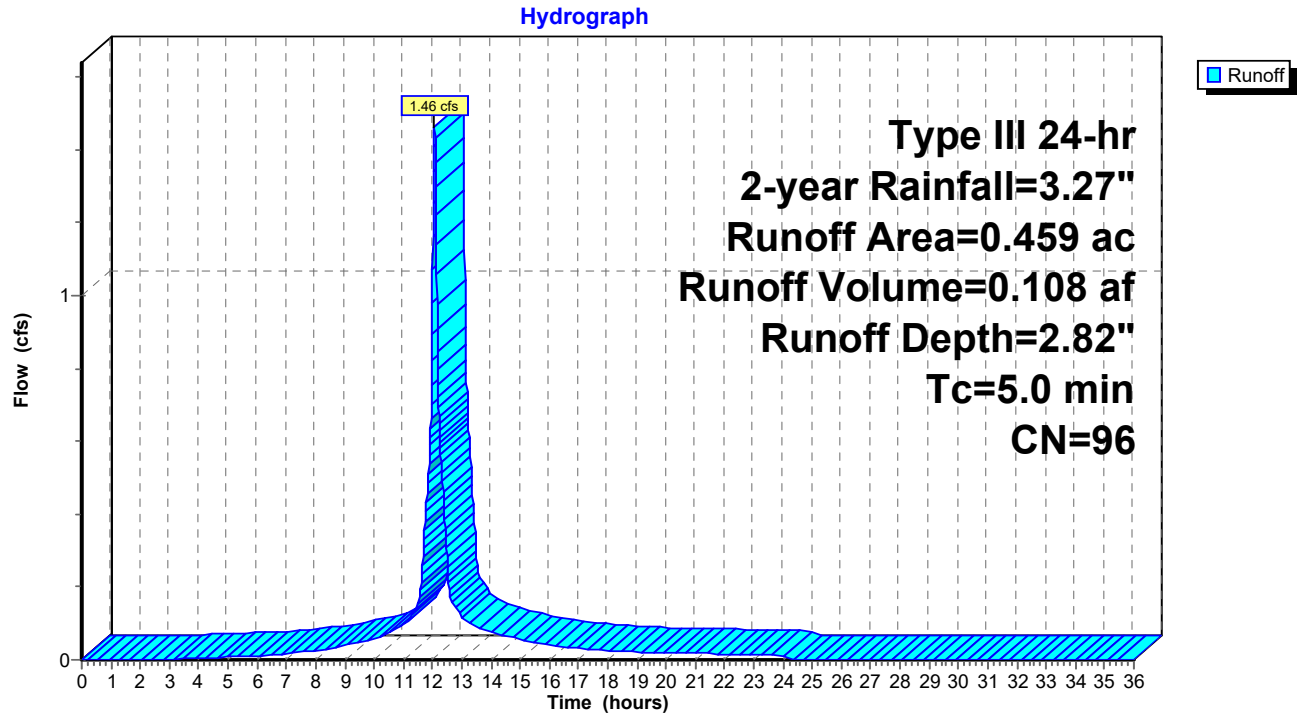
Runoff = 1.46 cfs @ 12.07 hrs, Volume= 0.108 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.001	89	<50% Grass cover, Poor, HSG D
0.296	98	Paved parking, HSG D
0.124	98	Roofs, HSG D
0.038	79	Woods, Fair, HSG D
0.459	96	Weighted Average
0.039		8.53% Pervious Area
0.420		91.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-2: Back of Site

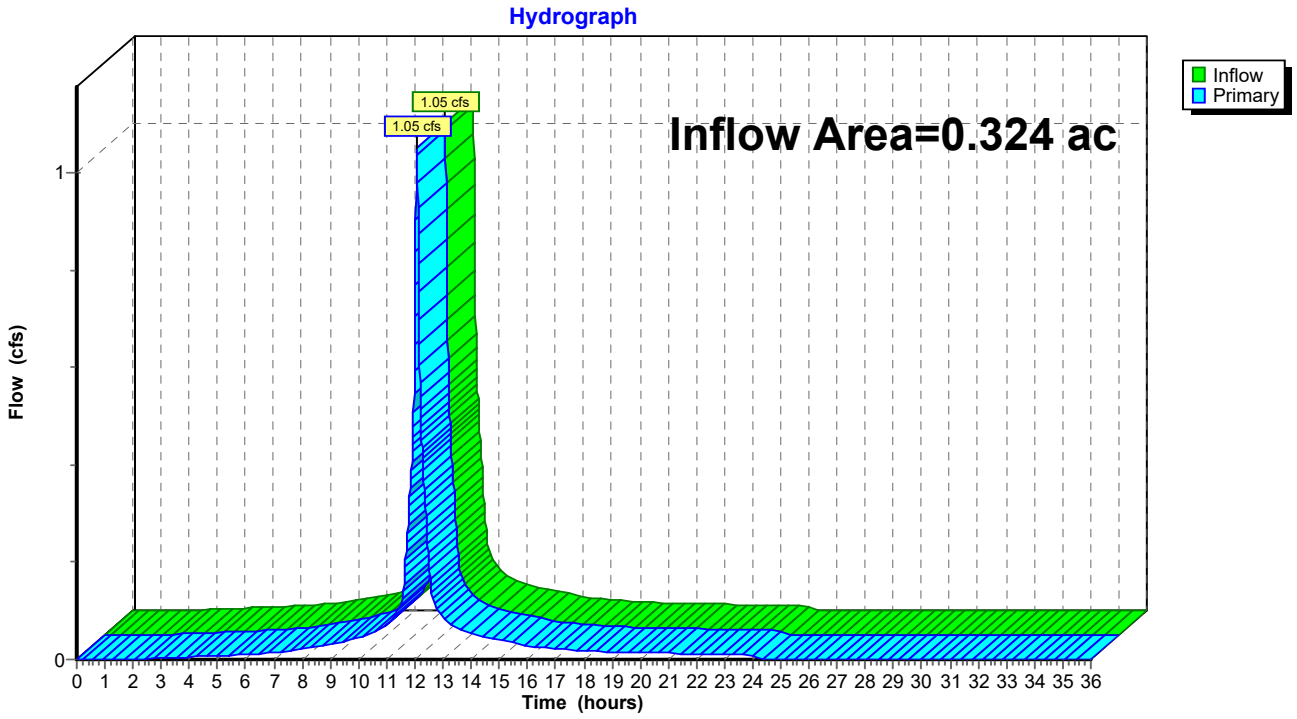


Summary for Link DP-1: Dudley Street

Inflow Area = 0.324 ac, 94.26% Impervious, Inflow Depth = 2.93" for 2-year event
Inflow = 1.05 cfs @ 12.07 hrs, Volume= 0.079 af
Primary = 1.05 cfs @ 12.07 hrs, Volume= 0.079 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

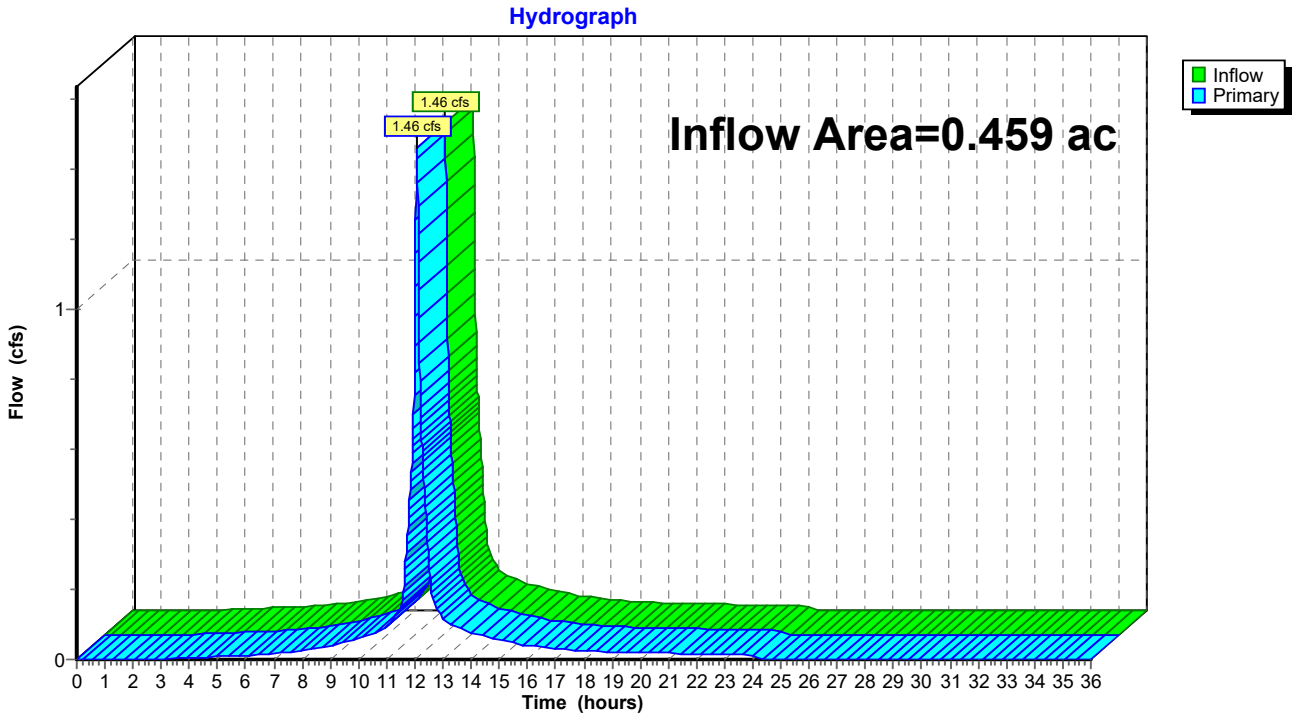


Summary for Link DP-2: Mill Brook

Inflow Area = 0.459 ac, 91.47% Impervious, Inflow Depth = 2.82" for 2-year event
Inflow = 1.46 cfs @ 12.07 hrs, Volume= 0.108 af
Primary = 1.46 cfs @ 12.07 hrs, Volume= 0.108 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



10-Year Storm Event – Existing

Summary for Subcatchment EX-1: Front of Site

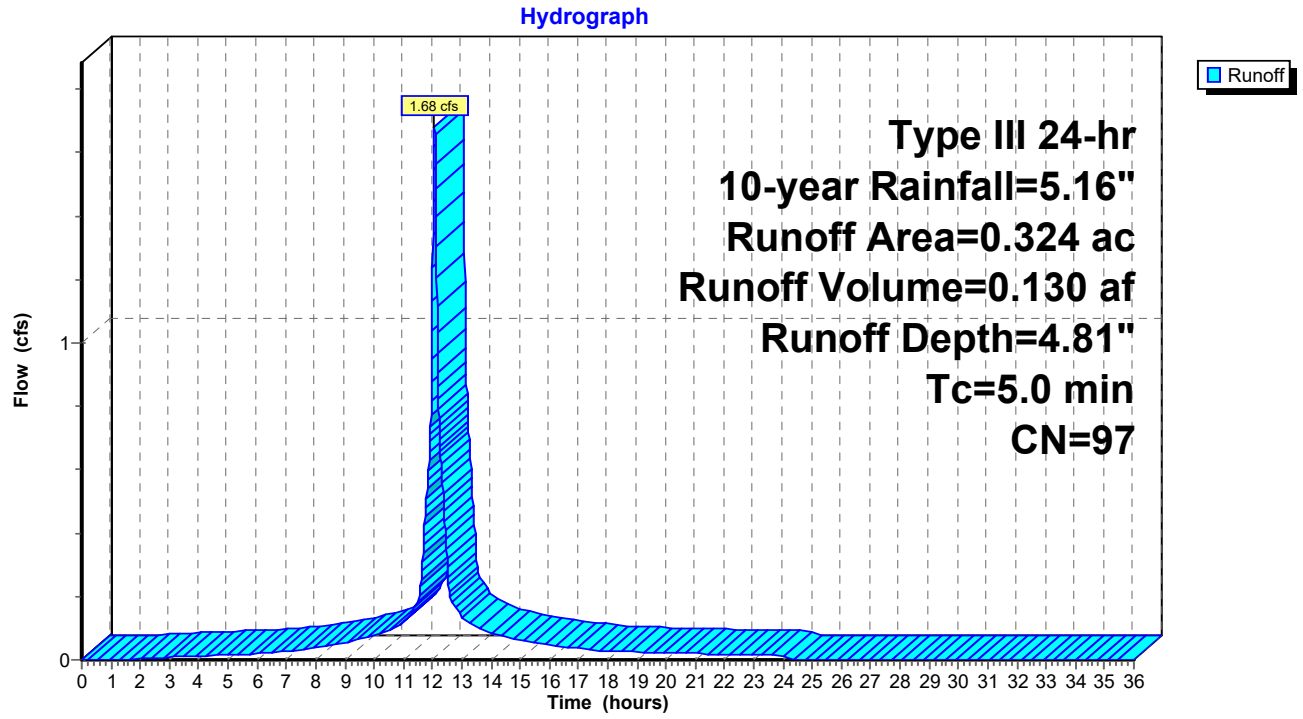
Runoff = 1.68 cfs @ 12.07 hrs, Volume= 0.130 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.016	89	<50% Grass cover, Poor, HSG D
0.003	80	>75% Grass cover, Good, HSG D
0.179	98	Paved parking, HSG D
0.127	98	Roofs, HSG D
0.324	97	Weighted Average
0.019		5.74% Pervious Area
0.305		94.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-1: Front of Site



Summary for Subcatchment EX-2: Back of Site

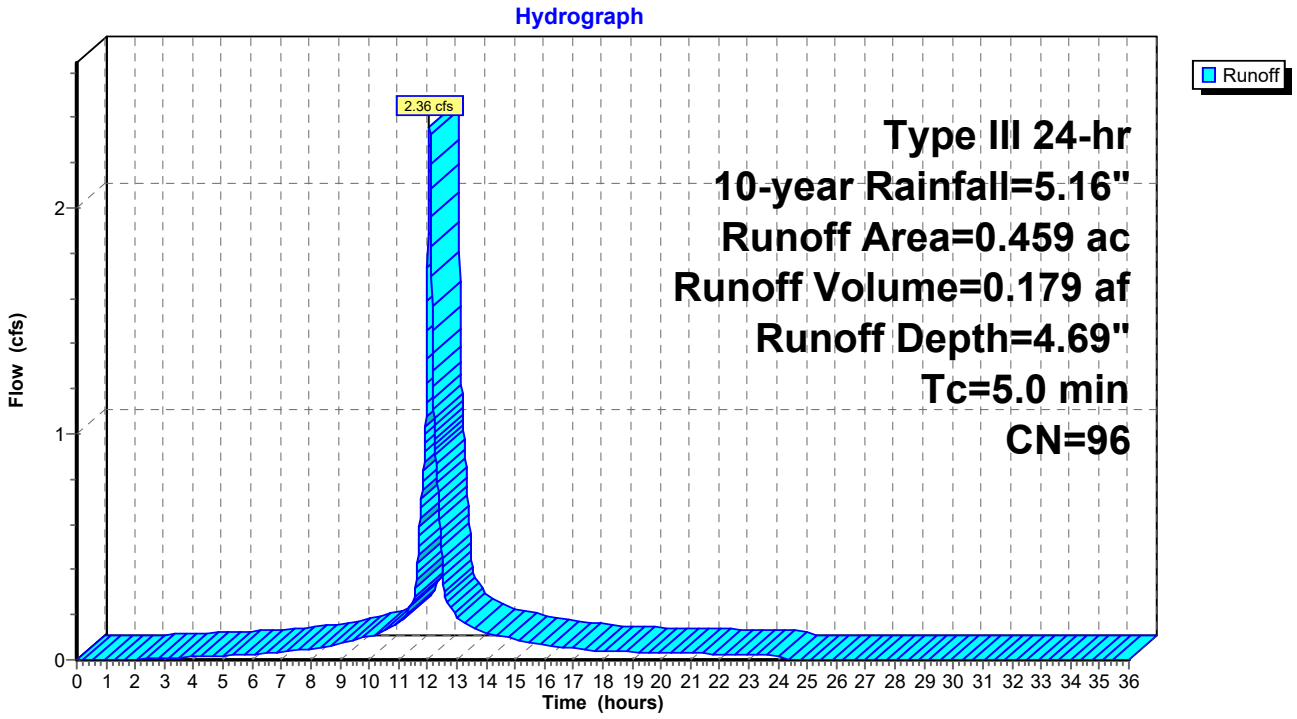
Runoff = 2.36 cfs @ 12.07 hrs, Volume= 0.179 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.001	89	<50% Grass cover, Poor, HSG D
0.296	98	Paved parking, HSG D
0.124	98	Roofs, HSG D
0.038	79	Woods, Fair, HSG D
0.459	96	Weighted Average
0.039		8.53% Pervious Area
0.420		91.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-2: Back of Site

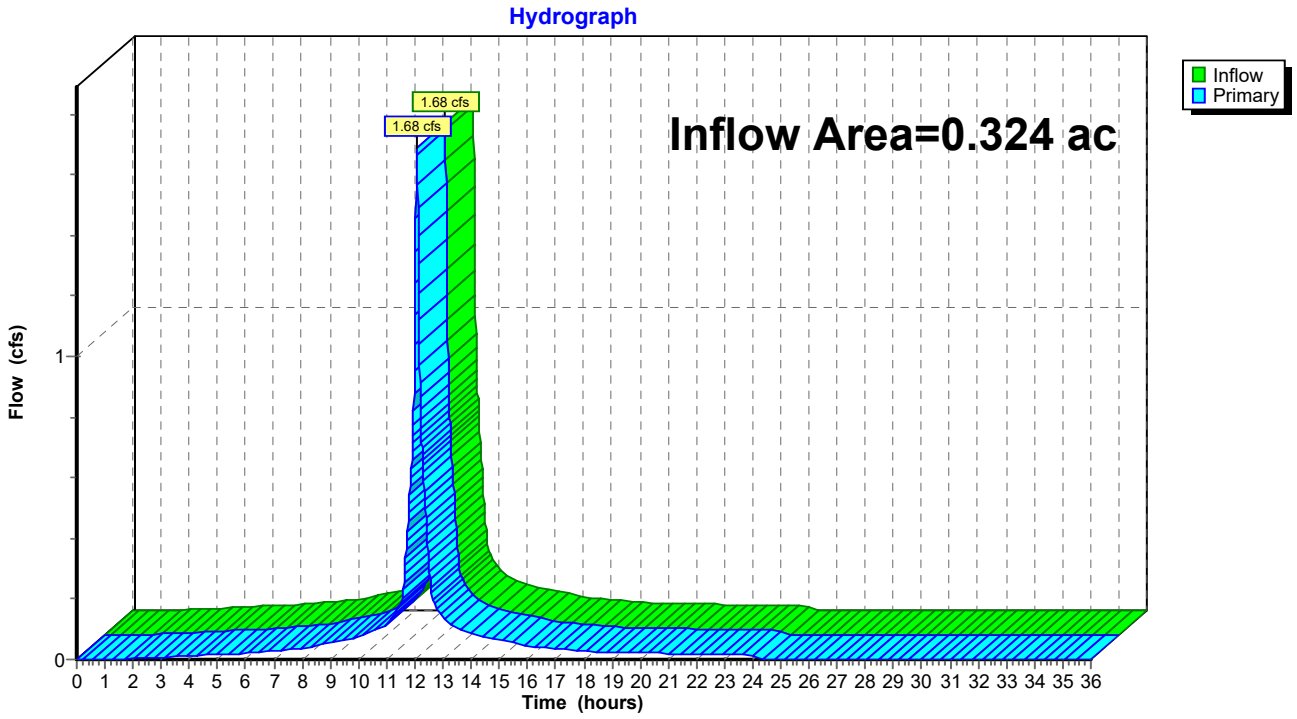


Summary for Link DP-1: Dudley Street

Inflow Area = 0.324 ac, 94.26% Impervious, Inflow Depth = 4.81" for 10-year event
Inflow = 1.68 cfs @ 12.07 hrs, Volume= 0.130 af
Primary = 1.68 cfs @ 12.07 hrs, Volume= 0.130 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

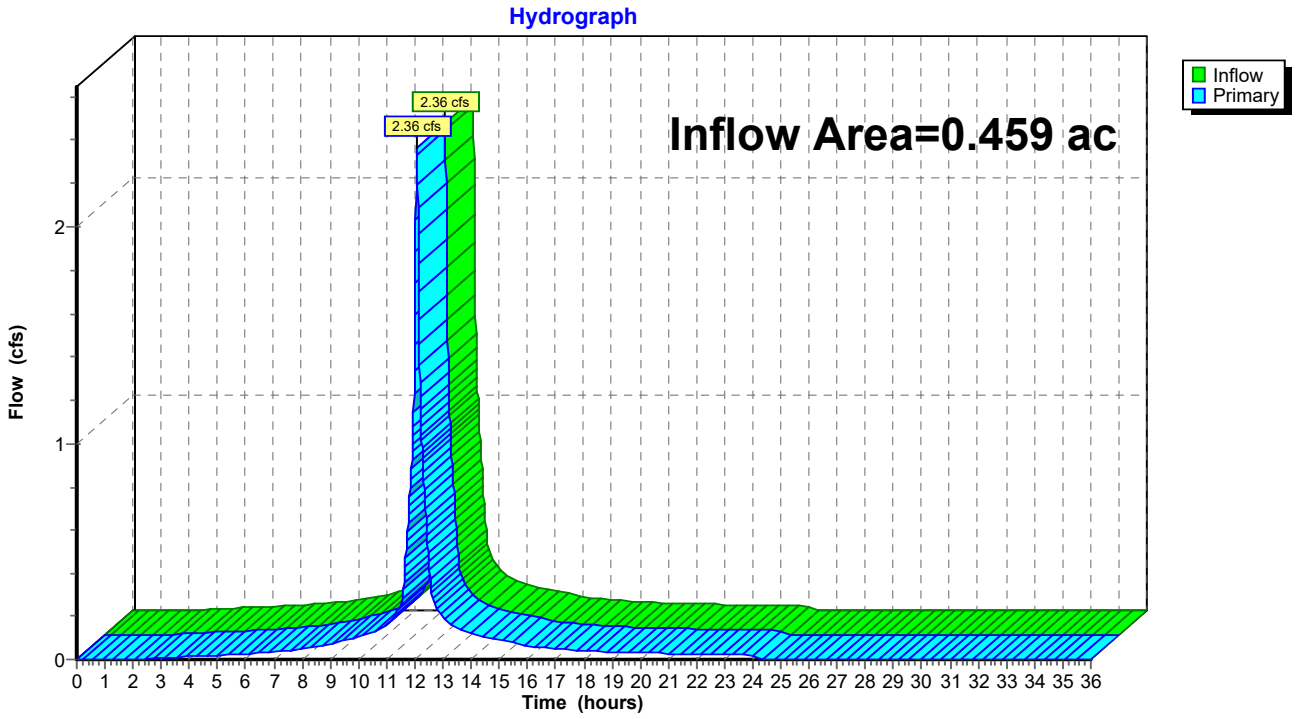


Summary for Link DP-2: Mill Brook

Inflow Area = 0.459 ac, 91.47% Impervious, Inflow Depth = 4.69" for 10-year event
Inflow = 2.36 cfs @ 12.07 hrs, Volume= 0.179 af
Primary = 2.36 cfs @ 12.07 hrs, Volume= 0.179 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



25-Year Storm Event – Existing

Summary for Subcatchment EX-1: Front of Site

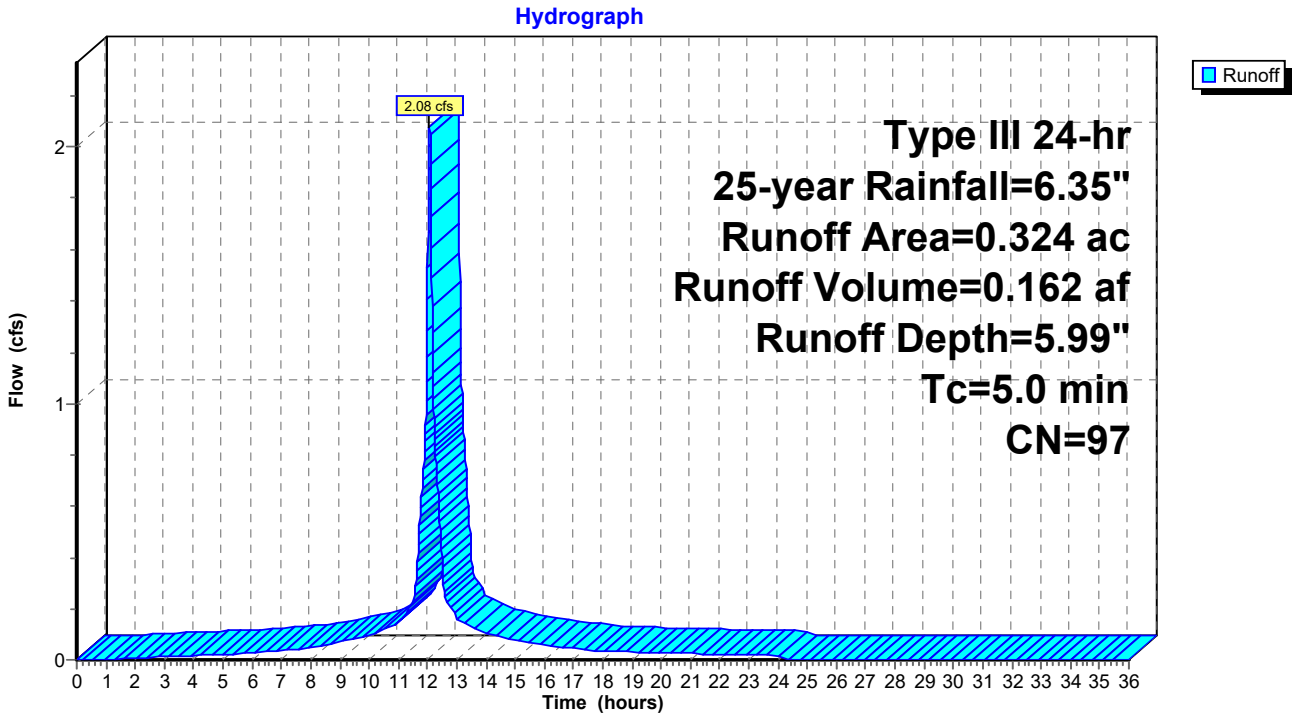
Runoff = 2.08 cfs @ 12.07 hrs, Volume= 0.162 af, Depth= 5.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.016	89	<50% Grass cover, Poor, HSG D
0.003	80	>75% Grass cover, Good, HSG D
0.179	98	Paved parking, HSG D
0.127	98	Roofs, HSG D
0.324	97	Weighted Average
0.019		5.74% Pervious Area
0.305		94.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-1: Front of Site



Summary for Subcatchment EX-2: Back of Site

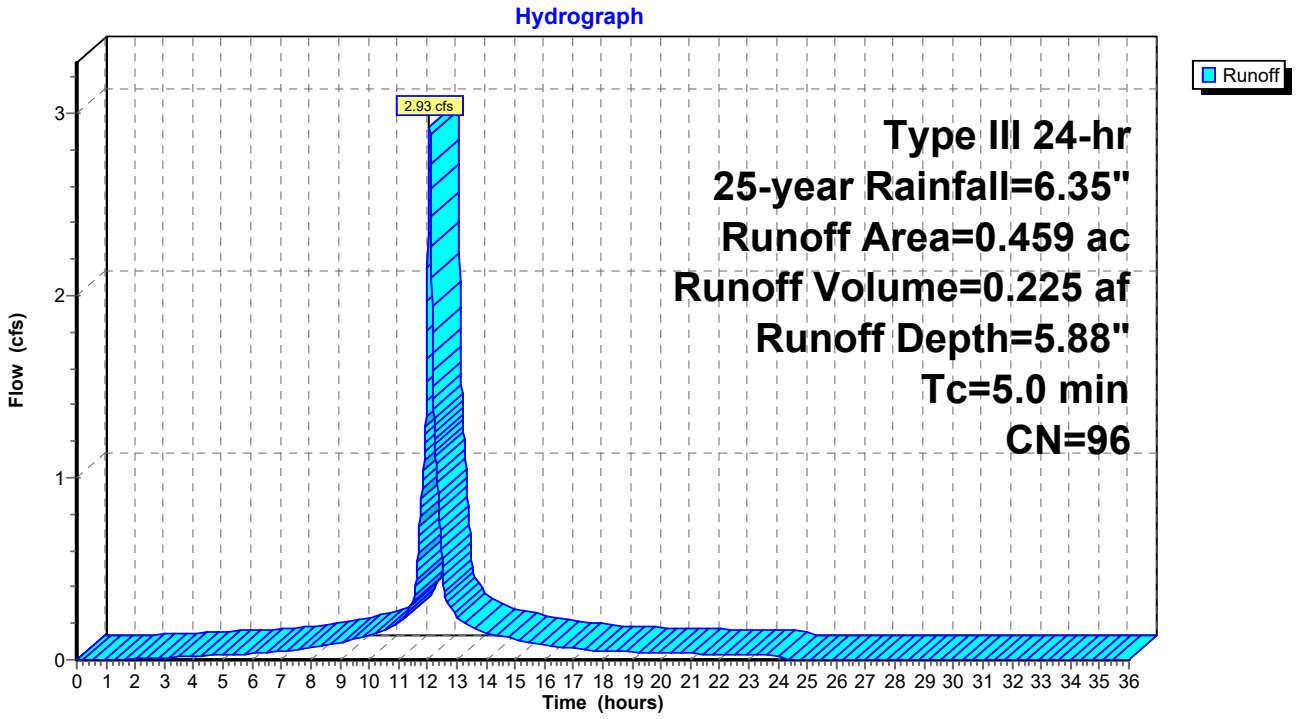
Runoff = 2.93 cfs @ 12.07 hrs, Volume= 0.225 af, Depth= 5.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.001	89	<50% Grass cover, Poor, HSG D
0.296	98	Paved parking, HSG D
0.124	98	Roofs, HSG D
0.038	79	Woods, Fair, HSG D
0.459	96	Weighted Average
0.039		8.53% Pervious Area
0.420		91.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-2: Back of Site

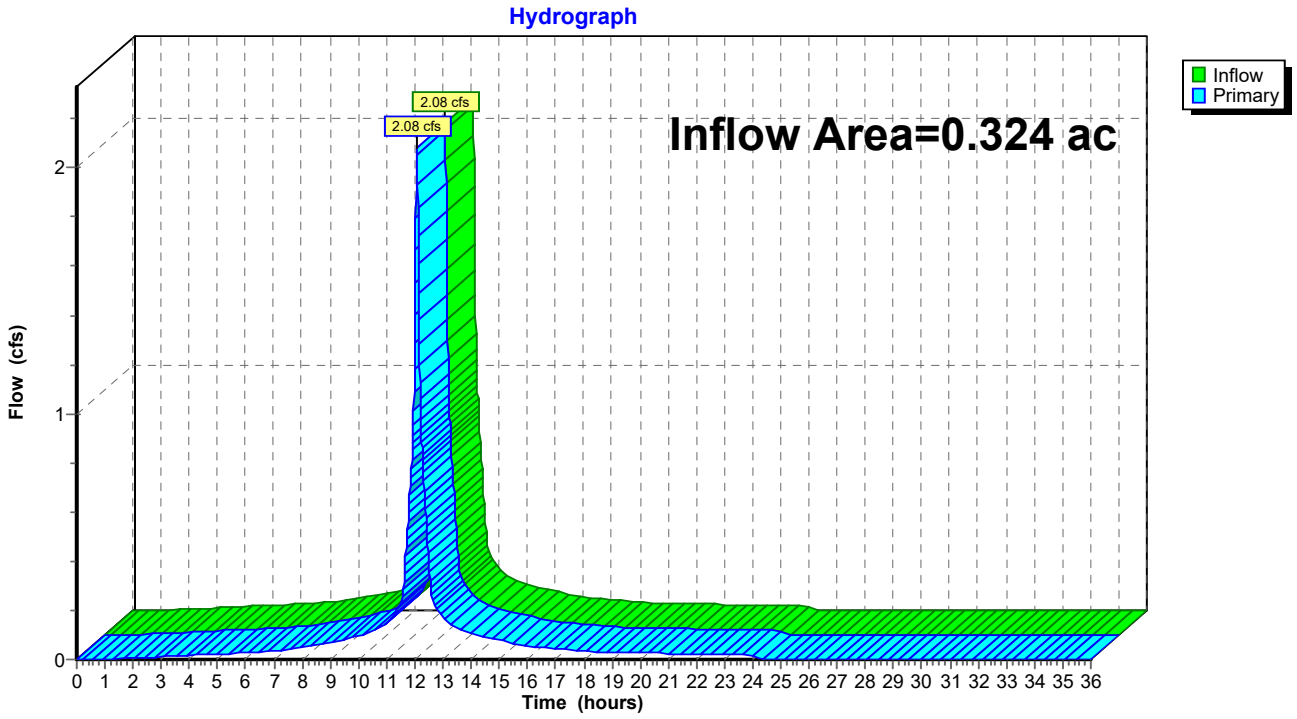


Summary for Link DP-1: Dudley Street

Inflow Area = 0.324 ac, 94.26% Impervious, Inflow Depth = 5.99" for 25-year event
Inflow = 2.08 cfs @ 12.07 hrs, Volume= 0.162 af
Primary = 2.08 cfs @ 12.07 hrs, Volume= 0.162 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

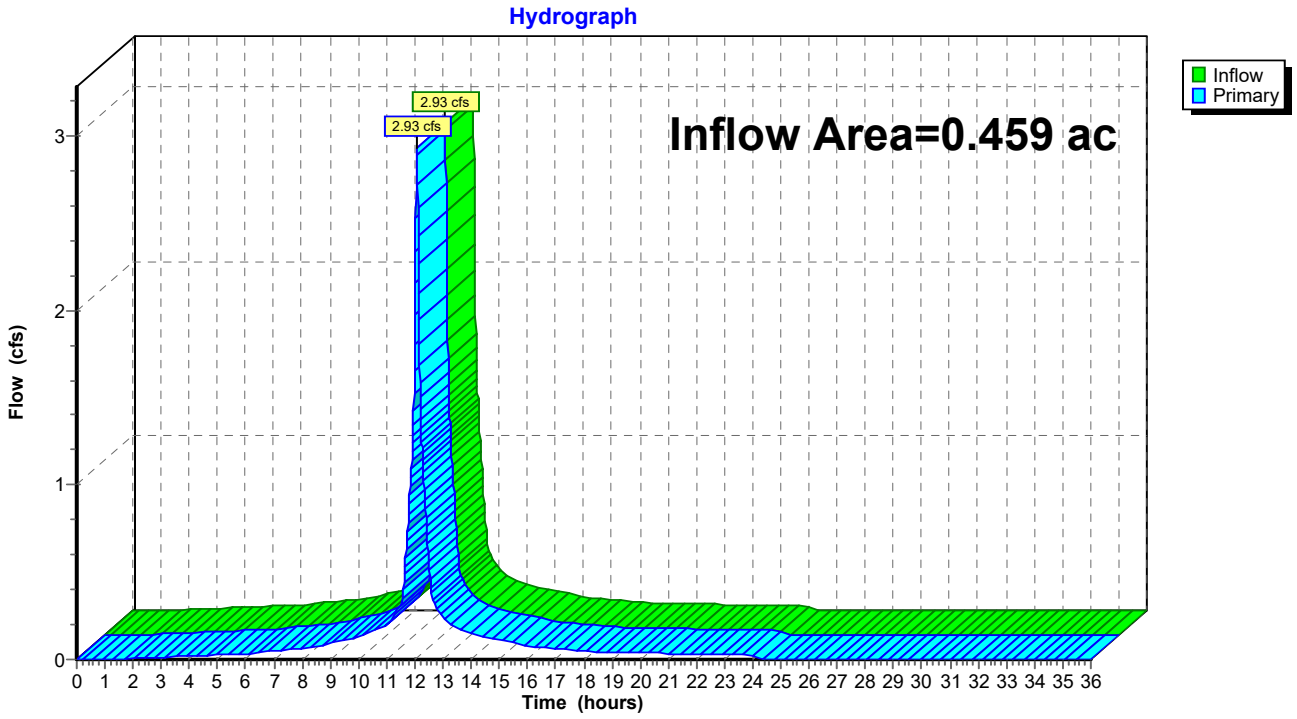


Summary for Link DP-2: Mill Brook

Inflow Area = 0.459 ac, 91.47% Impervious, Inflow Depth = 5.88" for 25-year event
Inflow = 2.93 cfs @ 12.07 hrs, Volume= 0.225 af
Primary = 2.93 cfs @ 12.07 hrs, Volume= 0.225 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



100-Year Storm Event – Existing

Summary for Subcatchment EX-1: Front of Site

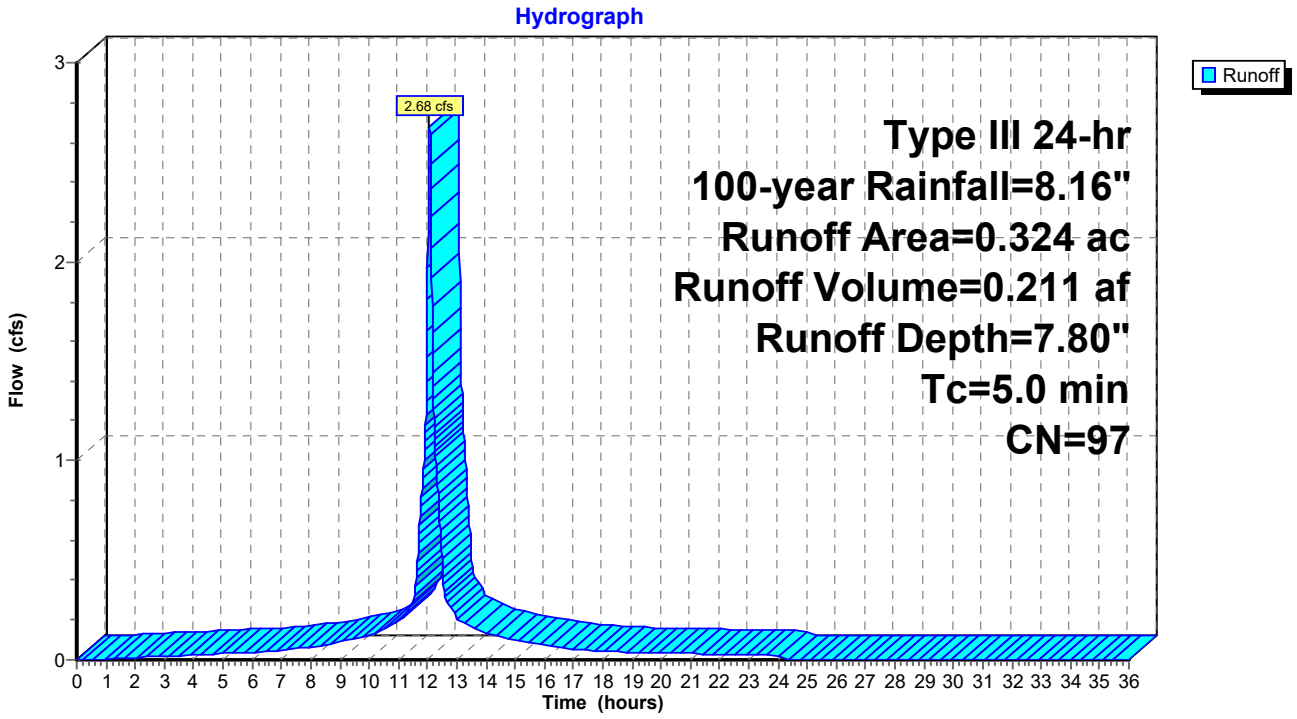
Runoff = 2.68 cfs @ 12.07 hrs, Volume= 0.211 af, Depth= 7.80"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.016	89	<50% Grass cover, Poor, HSG D
0.003	80	>75% Grass cover, Good, HSG D
0.179	98	Paved parking, HSG D
0.127	98	Roofs, HSG D
0.324	97	Weighted Average
0.019		5.74% Pervious Area
0.305		94.26% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-1: Front of Site



Summary for Subcatchment EX-2: Back of Site

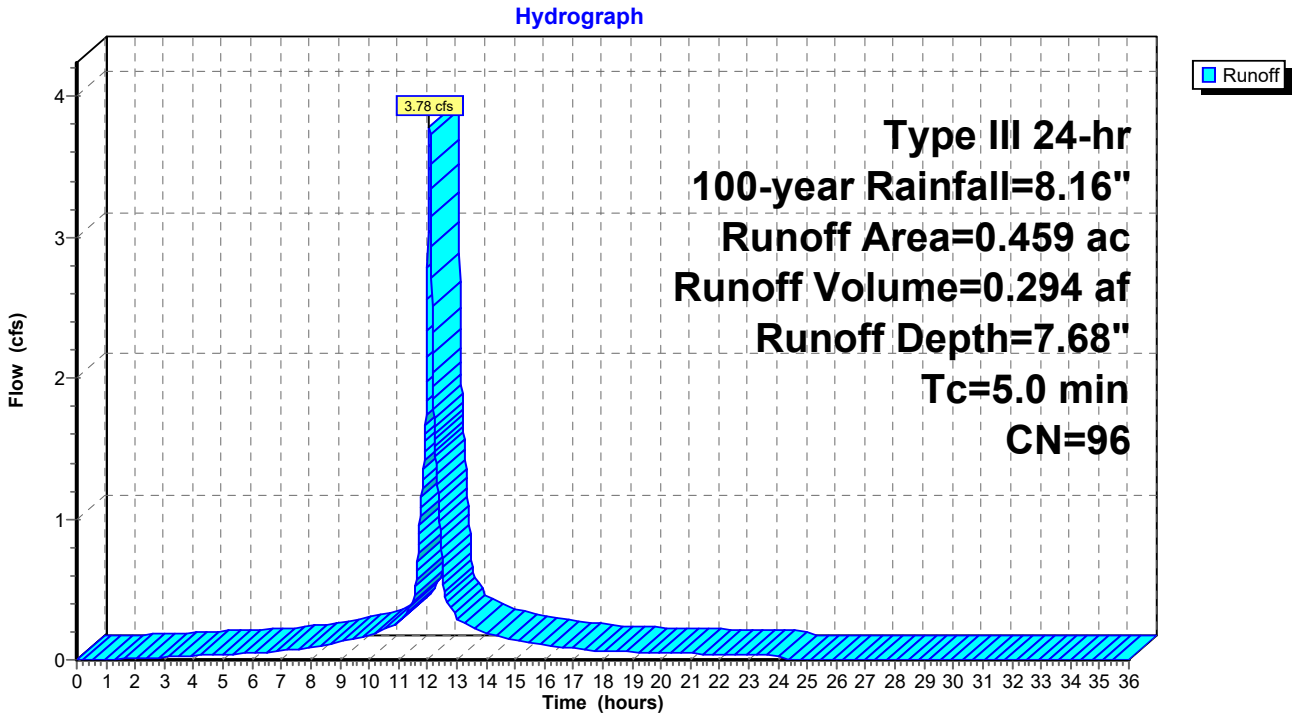
Runoff = 3.78 cfs @ 12.07 hrs, Volume= 0.294 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.001	89	<50% Grass cover, Poor, HSG D
0.296	98	Paved parking, HSG D
0.124	98	Roofs, HSG D
0.038	79	Woods, Fair, HSG D
0.459	96	Weighted Average
0.039		8.53% Pervious Area
0.420		91.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment EX-2: Back of Site

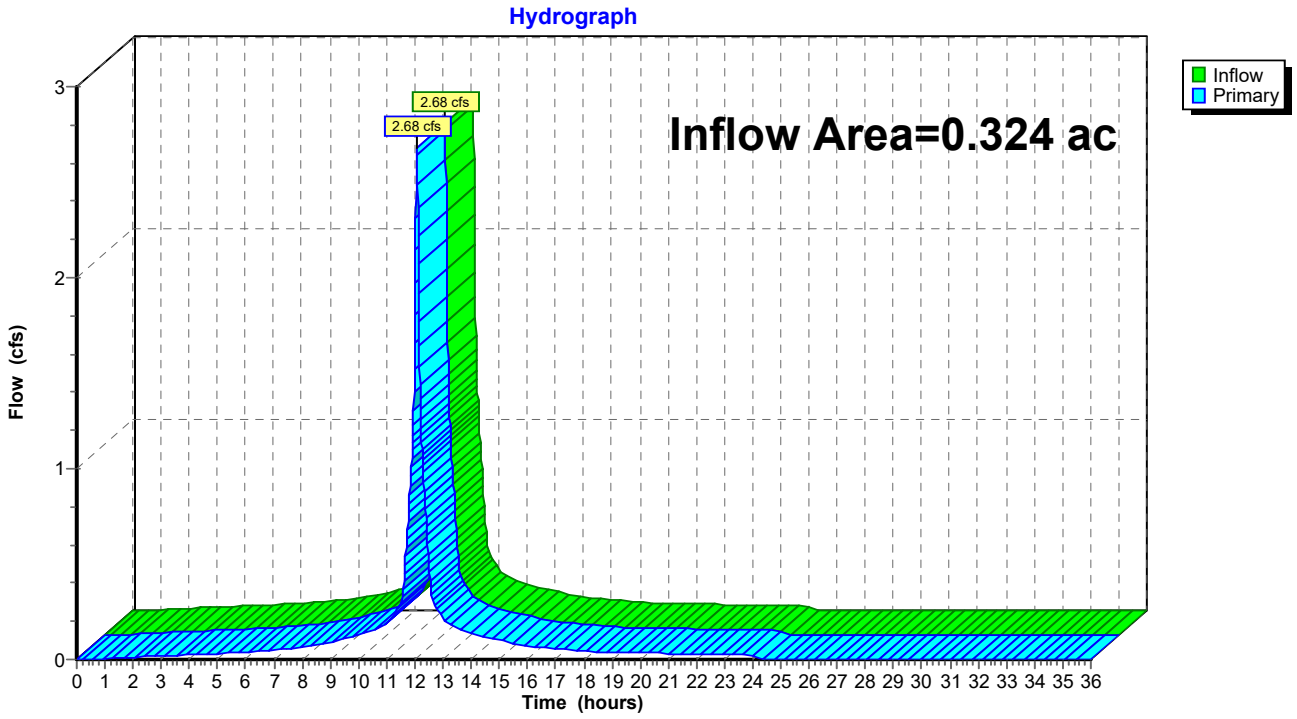


Summary for Link DP-1: Dudley Street

Inflow Area = 0.324 ac, 94.26% Impervious, Inflow Depth = 7.80" for 100-year event
Inflow = 2.68 cfs @ 12.07 hrs, Volume= 0.211 af
Primary = 2.68 cfs @ 12.07 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

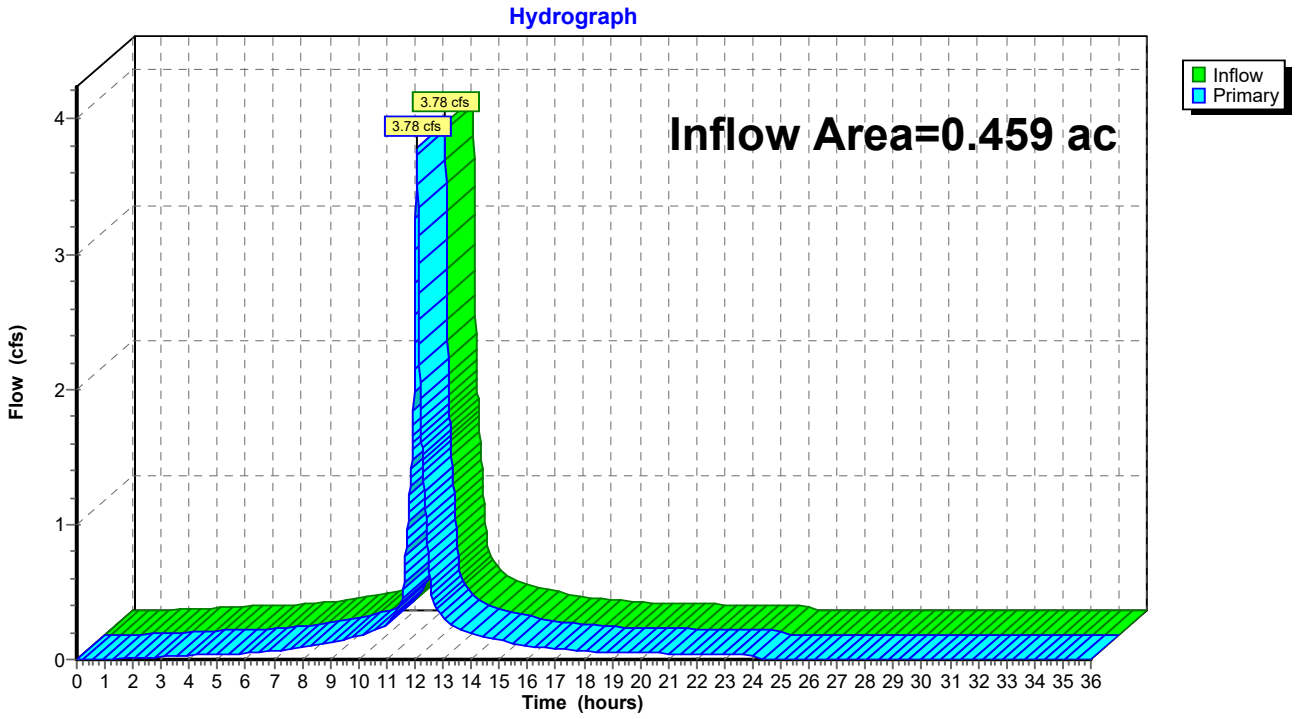


Summary for Link DP-2: Mill Brook

Inflow Area = 0.459 ac, 91.47% Impervious, Inflow Depth = 7.68" for 100-year event
Inflow = 3.78 cfs @ 12.07 hrs, Volume= 0.294 af
Primary = 3.78 cfs @ 12.07 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.0 min

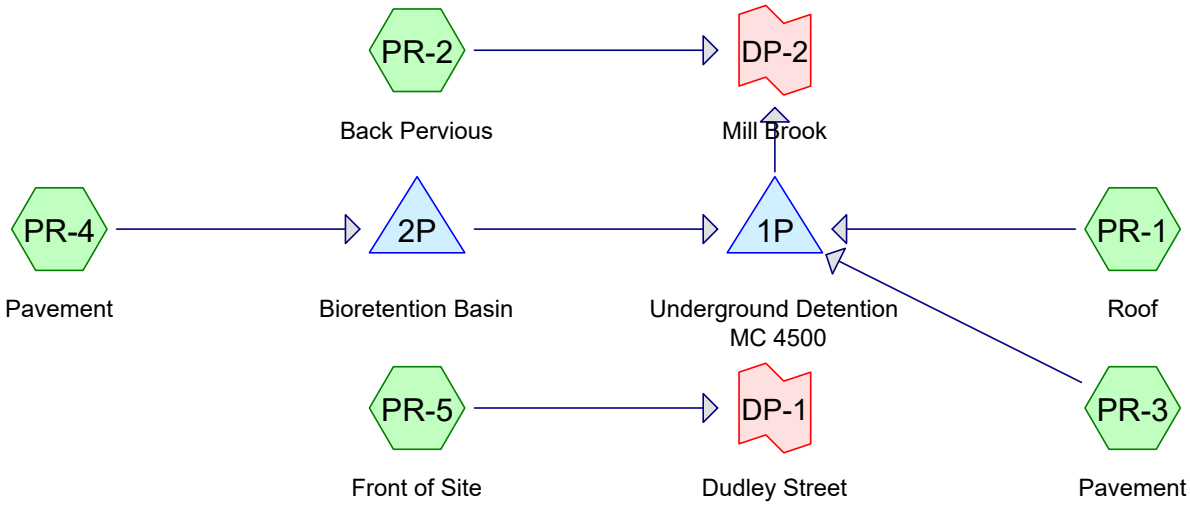
Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



HydroCAD Analysis: Proposed Conditions

2-Year Storm Event – Proposed



Subcat Reach Pond Link

Routing Diagram for 52816.00 - Proposed
Prepared by VHB, Printed 2/4/2022
HydroCAD® 10.10-5a s/n 01038 © 2020 HydroCAD Software Solutions LLC

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-year	Type III 24-hr		Default	24.00	1	3.27	2
2	10-year	Type III 24-hr		Default	24.00	1	5.16	2
3	25-year	Type III 24-hr		Default	24.00	1	6.35	2
4	100-year	Type III 24-hr		Default	24.00	1	8.16	2

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.179	80	>75% Grass cover, Good, HSG D (PR-2, PR-3, PR-5)
0.088	98	Paved parking, HSG D (PR-2, PR-3, PR-4, PR-5)
0.515	98	Roofs, HSG D (PR-1)
0.783	**94**	**TOTAL AREA**

52816.00 - Proposed
Prepared by VHB
Printed 2/4/2022
HydroCAD® 10.10-5a s/n 01038 © 2020 HydroCAD Software Solutions LLC

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.179	0.000	0.179	>75% Grass cover, Good	PR-2, PR-3, PR-5
0.000	0.000	0.000	0.088	0.000	0.088	Paved parking	PR-2, PR-3, PR-4, PR-5
0.000	0.000	0.000	0.515	0.000	0.515	Roofs	PR-1
0.000	**0.000**	**0.000**	**0.783**	**0.000**	**0.783**	**TOTAL AREA**	

Summary for Subcatchment PR-1: Roof

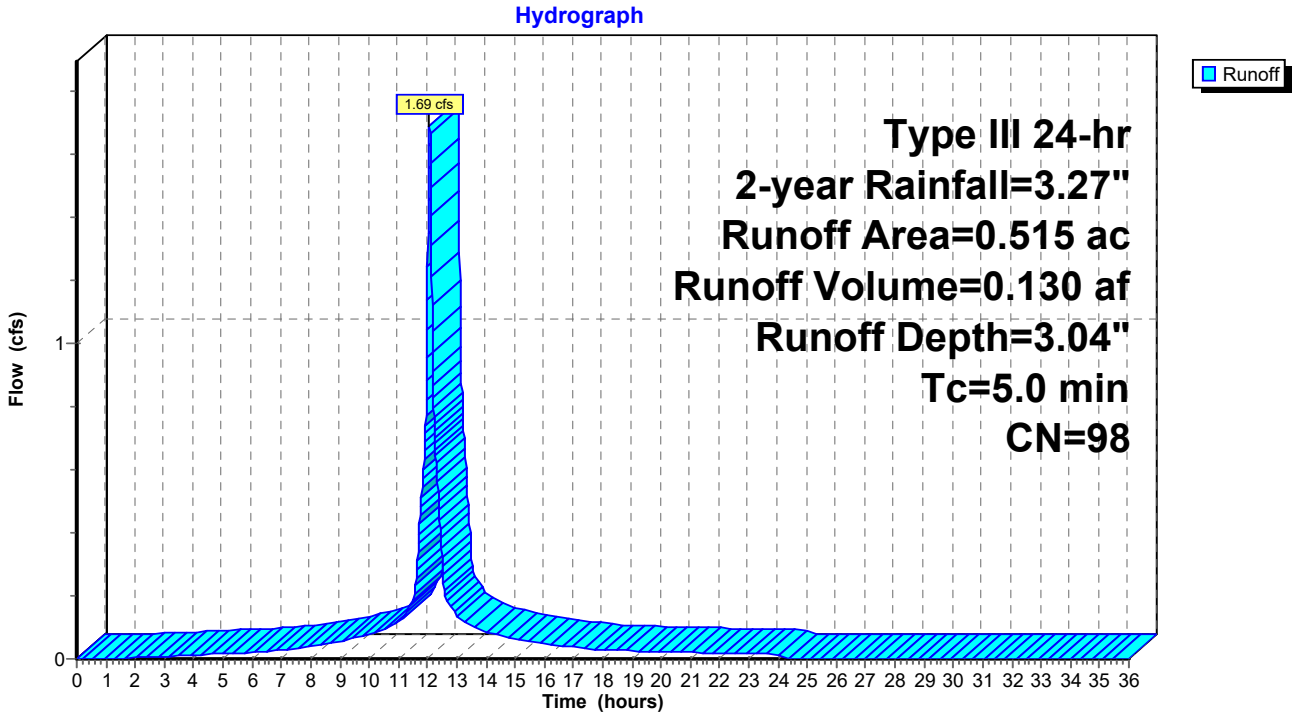
Runoff = 1.69 cfs @ 12.07 hrs, Volume= 0.130 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.515	98	Roofs, HSG D
0.515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-1: Roof



Summary for Subcatchment PR-2: Back Pervious

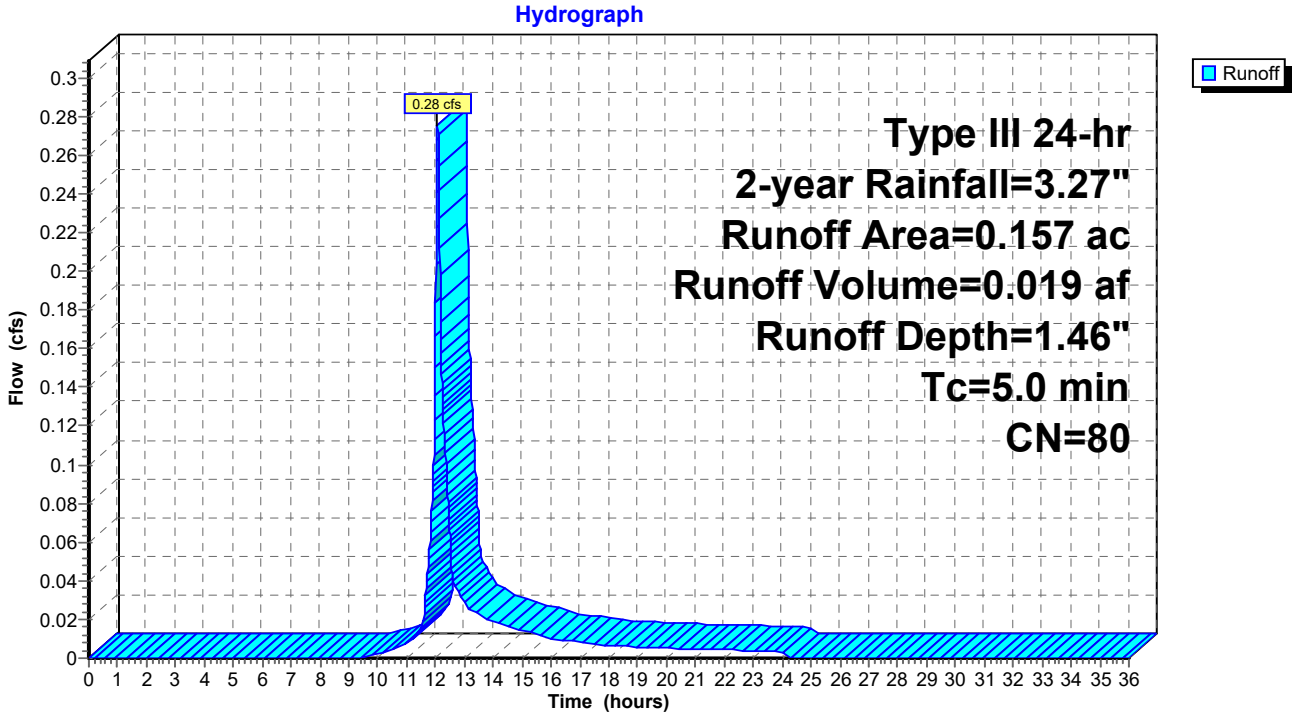
Runoff = 0.28 cfs @ 12.08 hrs, Volume= 0.019 af, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.156	80	>75% Grass cover, Good, HSG D
0.001	98	Paved parking, HSG D
0.157	80	Weighted Average
0.156		99.07% Pervious Area
0.001		0.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-2: Back Pervious



Summary for Subcatchment PR-3: Pavement

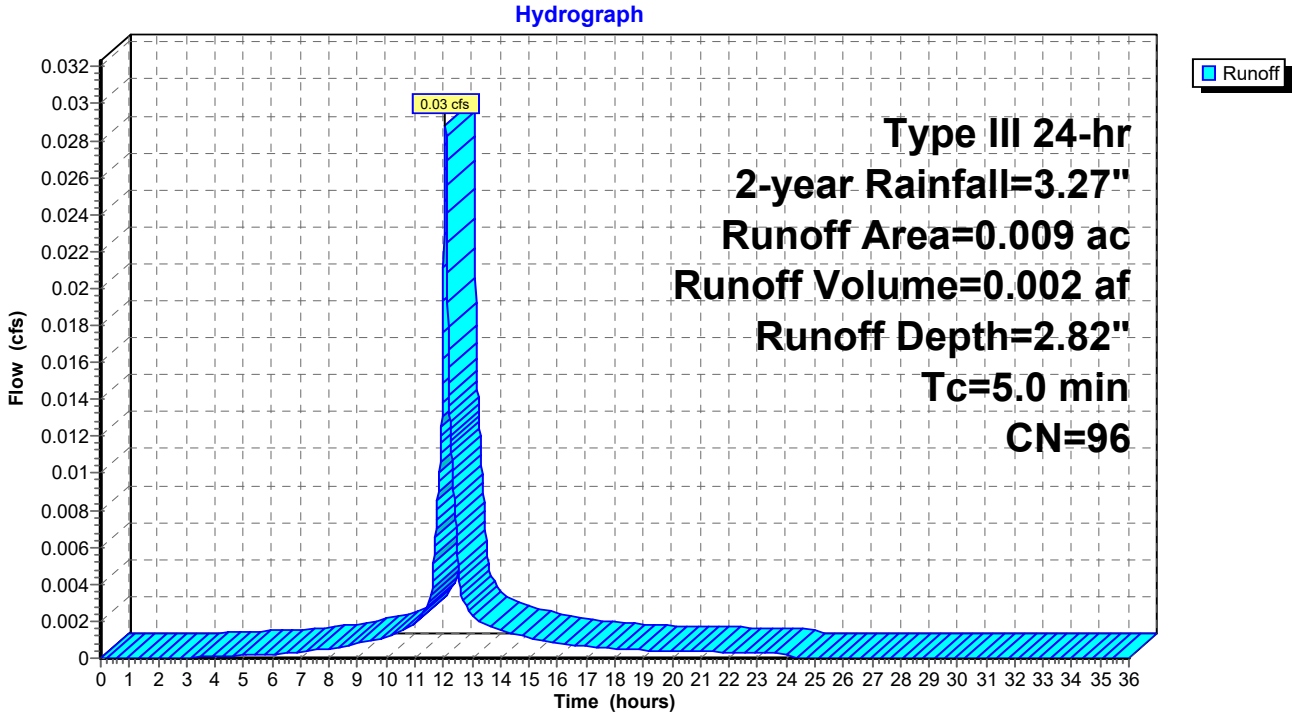
Runoff = 0.03 cfs @ 12.07 hrs, Volume= 0.002 af, Depth= 2.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.001	80	>75% Grass cover, Good, HSG D
0.008	98	Paved parking, HSG D
0.009	96	Weighted Average
0.001		10.00% Pervious Area
0.008		90.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-3: Pavement



Summary for Subcatchment PR-4: Pavement

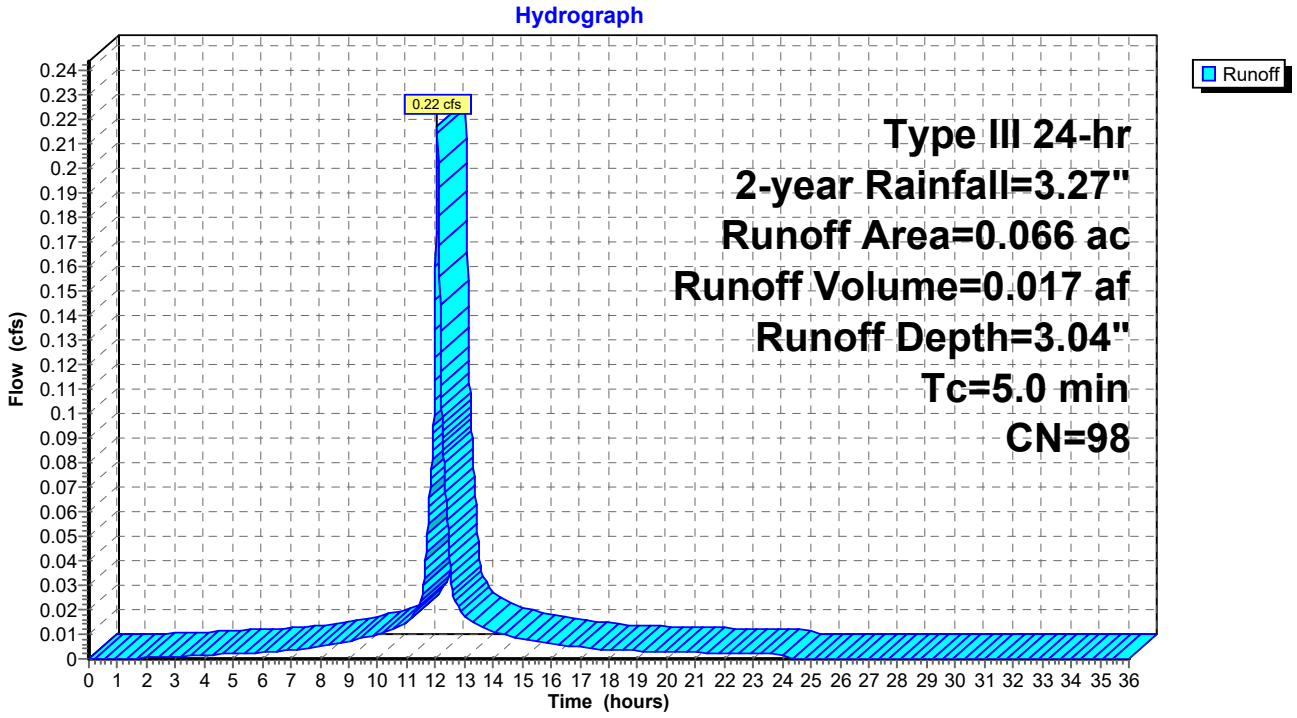
Runoff = 0.22 cfs @ 12.07 hrs, Volume= 0.017 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.066	98	Paved parking, HSG D
0.066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-4: Pavement



Summary for Subcatchment PR-5: Front of Site

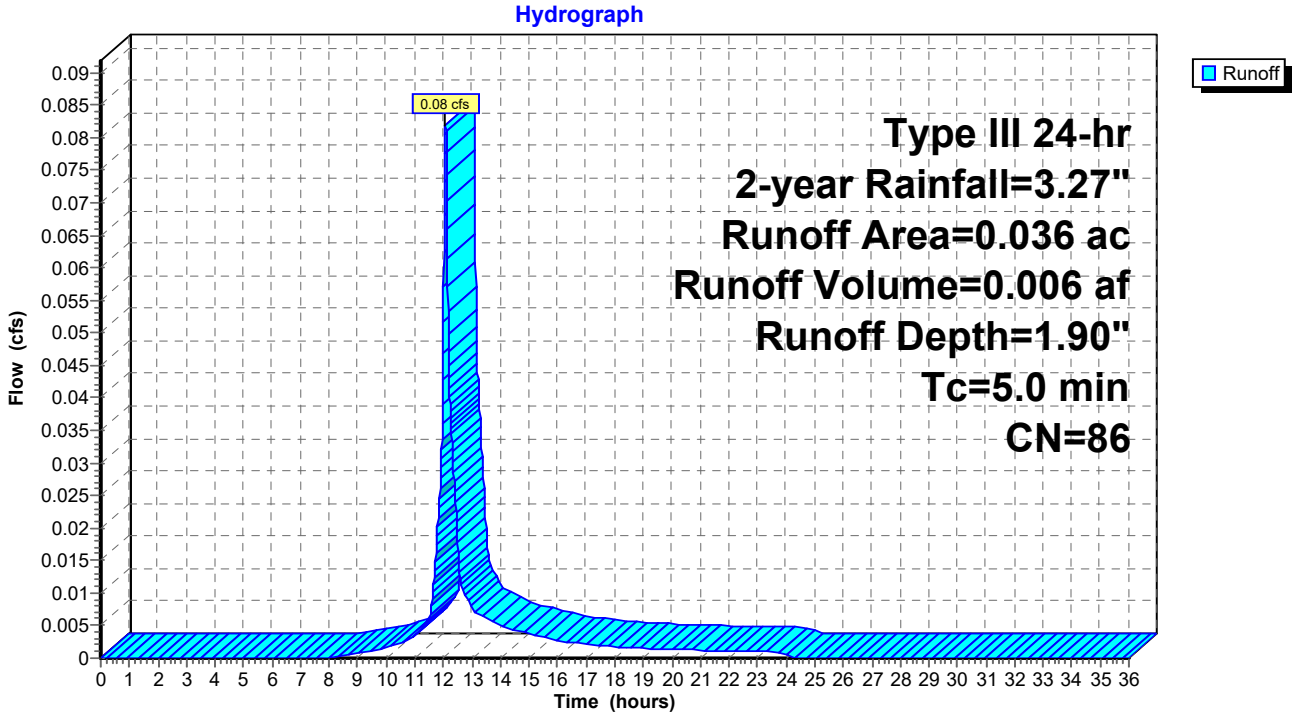
Runoff = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 1.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-year Rainfall=3.27"

Area (ac)	CN	Description
0.023	80	>75% Grass cover, Good, HSG D
0.013	98	Paved parking, HSG D
0.036	86	Weighted Average
0.023		64.04% Pervious Area
0.013		35.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-5: Front of Site



Summary for Pond 1P: Underground Detention MC 4500

Inflow Area = 0.590 ac, 99.85% Impervious, Inflow Depth = 2.84" for 2-year event
Inflow = 1.92 cfs @ 12.07 hrs, Volume= 0.140 af
Outflow = 0.52 cfs @ 12.40 hrs, Volume= 0.140 af, Atten= 73%, Lag= 19.8 min
Discarded = 0.06 cfs @ 9.40 hrs, Volume= 0.109 af
Primary = 0.46 cfs @ 12.40 hrs, Volume= 0.030 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 72.20' @ 12.40 hrs Surf.Area= 1,112 sf Storage= 2,371 cf

Plug-Flow detention time= 223.8 min calculated for 0.140 af (100% of inflow)
Center-of-Mass det. time= 223.8 min (977.9 - 754.1)

Volume	Invert	Avail.Storage	Storage Description
#1	69.10'	1,939 cf	**Custom Stage Data (Irregular)** Listed below 7,506 cf Overall - 2,659 cf Embedded = 4,847 cf x 40.0% Voids
#2	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#3	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#4	69.85'	611 cf	**ADS_StormTech MC-4500 b +Cap** x 5 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#5	69.85'	398 cf	**ADS_StormTech MC-4500 b +Cap** x 3 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
		4,598 cf	Total Available Storage

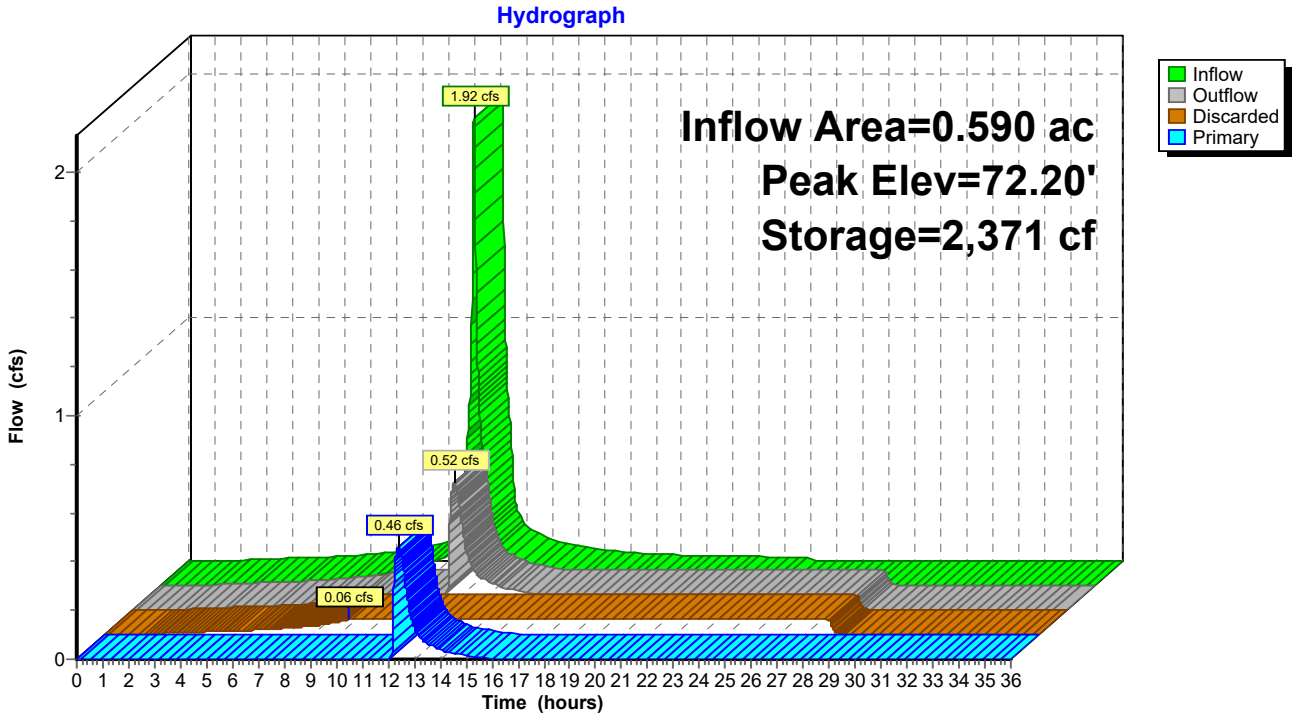
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.10	1,112	146.5	0	0	1,112
75.85	1,112	146.5	7,506	7,506	2,101

Device	Routing	Invert	Outlet Devices
#1	Primary	71.70'	**12.0" Round Culvert** L= 15.8' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 71.70' / 71.60' S= 0.0063 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	71.70'	**6.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	73.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	75.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Discarded	69.10'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 9.40 hrs HW=69.17' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=0.46 cfs @ 12.40 hrs HW=72.20' (Free Discharge)
└**1=Culvert** (Passes 0.46 cfs of 0.71 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.46 cfs @ 2.76 fps)
  ├**3=Orifice/Grate** (Controls 0.00 cfs)
  └**4=Sharp-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond 1P: Underground Detention MC 4500



Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 3.04" for 2-year event
Inflow = 0.22 cfs @ 12.07 hrs, Volume= 0.017 af
Outflow = 0.21 cfs @ 12.08 hrs, Volume= 0.017 af, Atten= 2%, Lag= 0.8 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.010 af
Primary = 0.20 cfs @ 12.08 hrs, Volume= 0.007 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 76.32' @ 12.08 hrs Surf.Area= 213 sf Storage= 81 cf

Plug-Flow detention time= 51.9 min calculated for 0.017 af (100% of inflow)
Center-of-Mass det. time= 51.9 min (806.9 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.50'	127 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

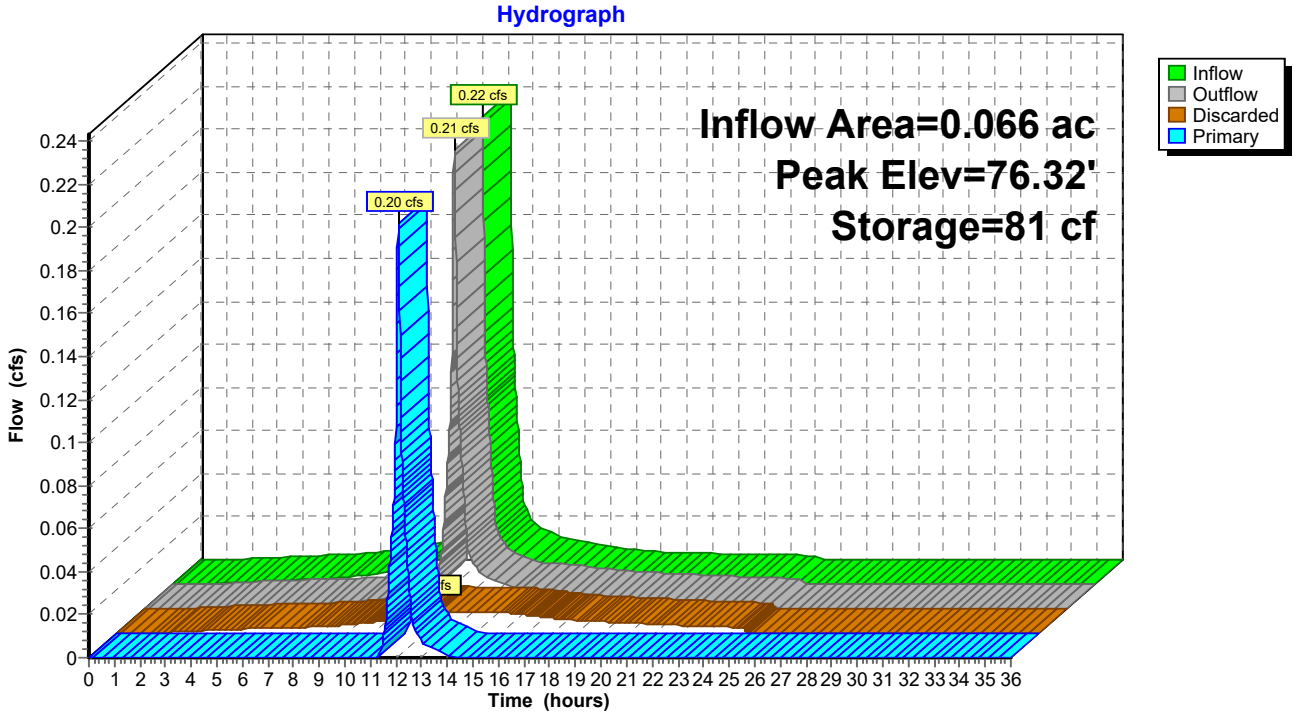
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.50	41	32.2	0	0	41
76.10	115	45.3	45	45	125
76.50	312	83.9	82	127	523

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**12.0" Round Culvert** L= 15.9' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 72.00' / 71.50' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	76.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Discarded	75.50'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=76.32' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.20 cfs @ 12.08 hrs HW=76.32' TW=75.72' (Fixed TW Elev= 75.72')
└**1=Culvert** (Passes 0.20 cfs of 2.94 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.20 cfs @ 0.88 fps)

Pond 2P: Bioretention Basin

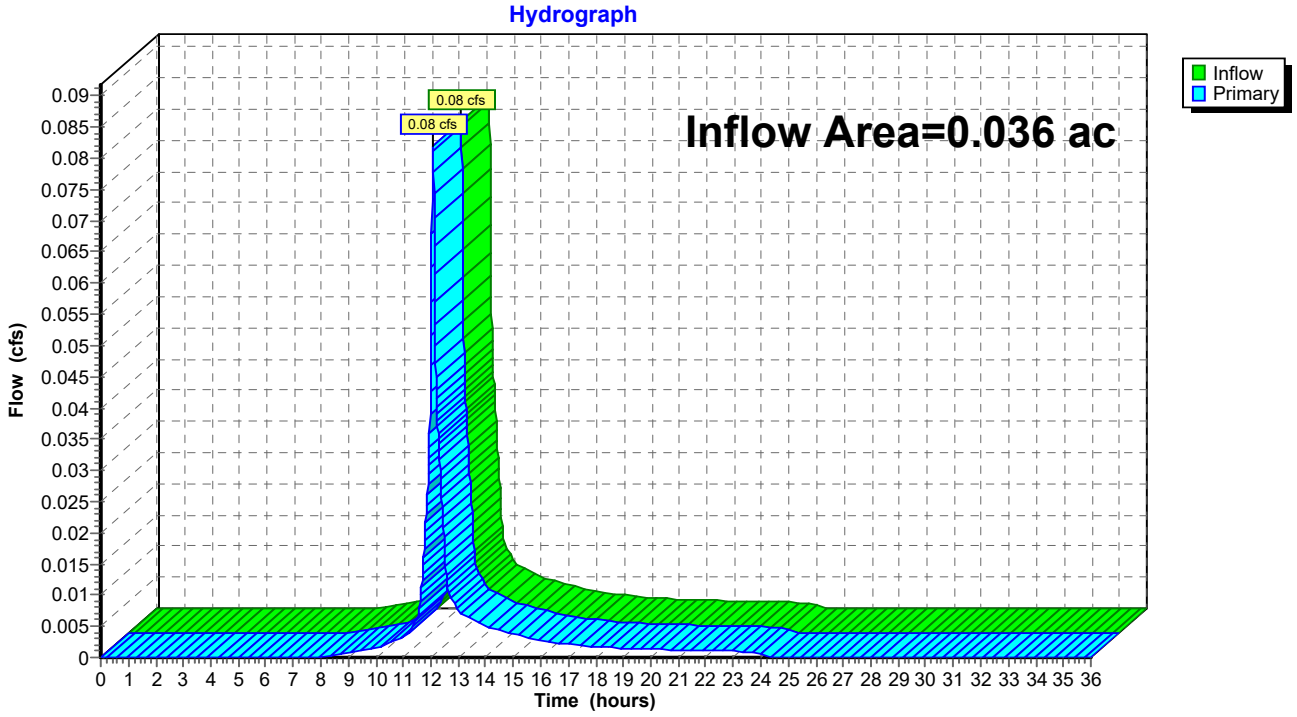


Summary for Link DP-1: Dudley Street

Inflow Area = 0.036 ac, 35.96% Impervious, Inflow Depth = 1.90" for 2-year event
Inflow = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af
Primary = 0.08 cfs @ 12.07 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

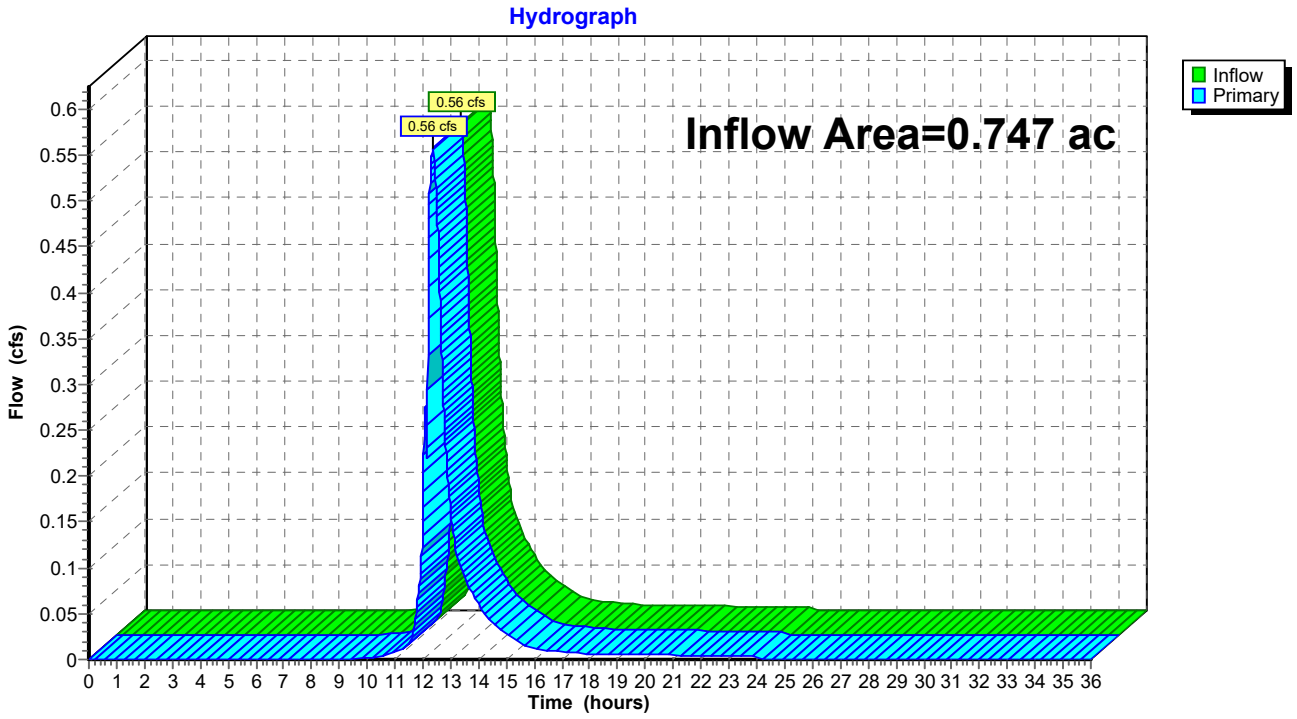


Summary for Link DP-2: Mill Brook

Inflow Area = 0.747 ac, 79.04% Impervious, Inflow Depth = 0.80" for 2-year event
Inflow = 0.56 cfs @ 12.36 hrs, Volume= 0.050 af
Primary = 0.56 cfs @ 12.36 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



10-Year Storm Event – Proposed

Summary for Subcatchment PR-1: Roof

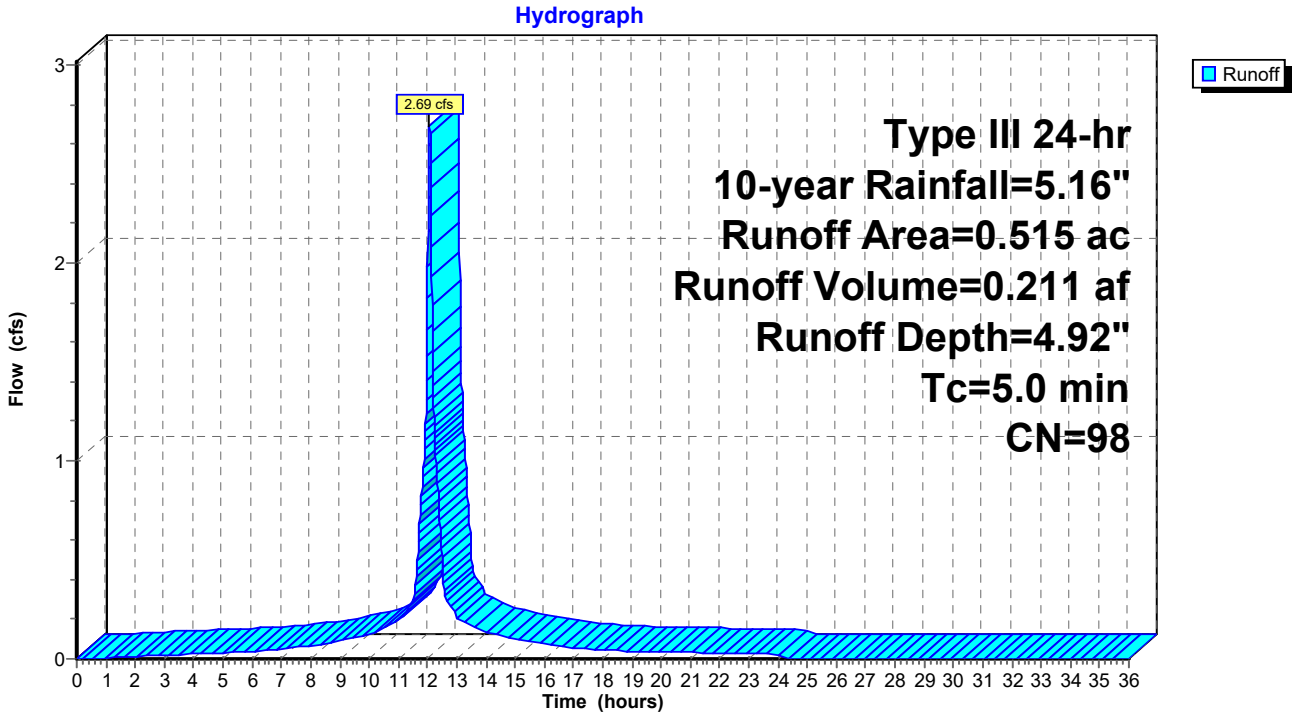
Runoff = 2.69 cfs @ 12.07 hrs, Volume= 0.211 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.515	98	Roofs, HSG D
0.515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-1: Roof



Summary for Subcatchment PR-2: Back Pervious

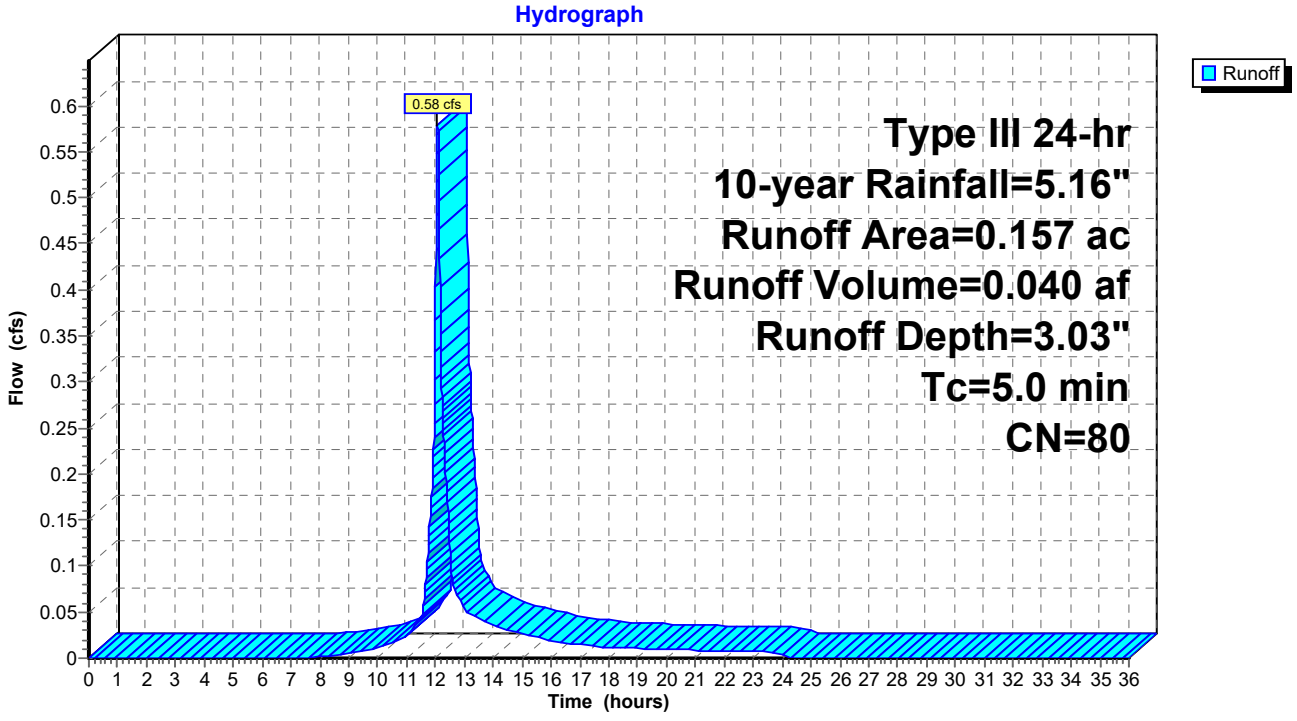
Runoff = 0.58 cfs @ 12.07 hrs, Volume= 0.040 af, Depth= 3.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.156	80	>75% Grass cover, Good, HSG D
0.001	98	Paved parking, HSG D
0.157	80	Weighted Average
0.156		99.07% Pervious Area
0.001		0.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-2: Back Pervious



Summary for Subcatchment PR-3: Pavement

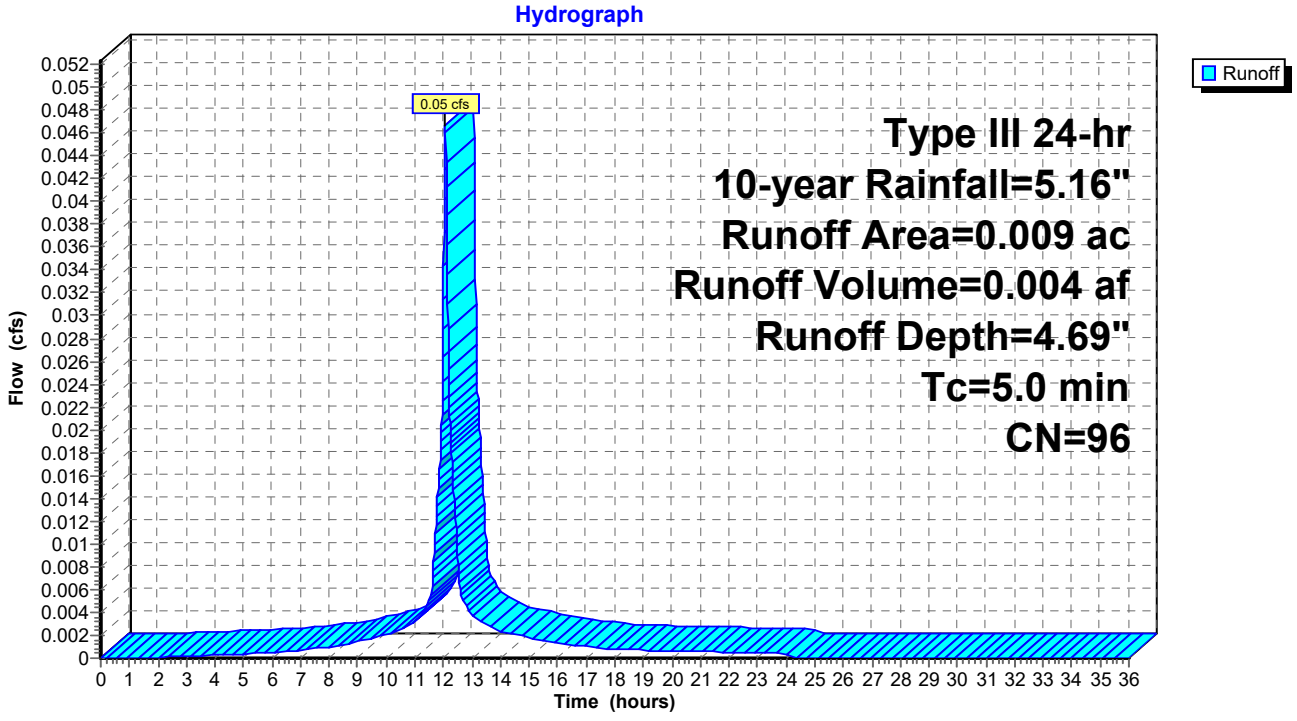
Runoff = 0.05 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.001	80	>75% Grass cover, Good, HSG D
0.008	98	Paved parking, HSG D
0.009	96	Weighted Average
0.001		10.00% Pervious Area
0.008		90.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-3: Pavement



Summary for Subcatchment PR-4: Pavement

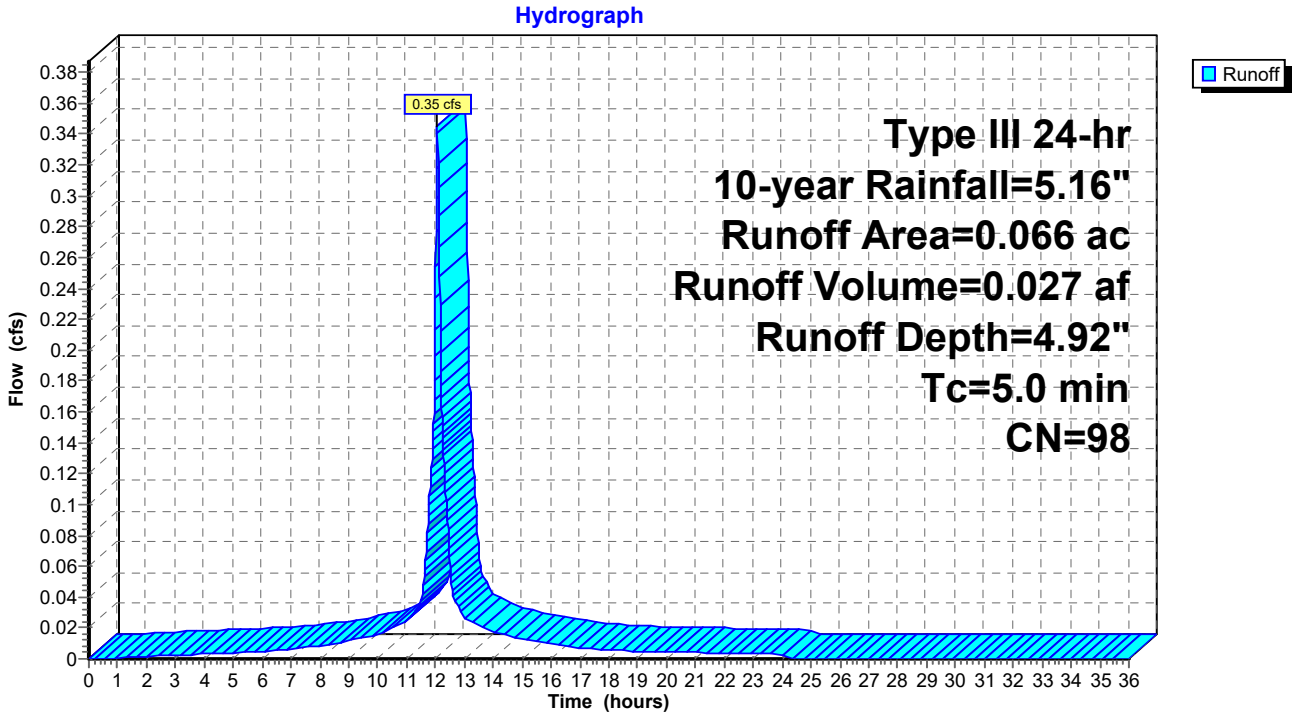
Runoff = 0.35 cfs @ 12.07 hrs, Volume= 0.027 af, Depth= 4.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.066	98	Paved parking, HSG D
0.066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-4: Pavement



Summary for Subcatchment PR-5: Front of Site

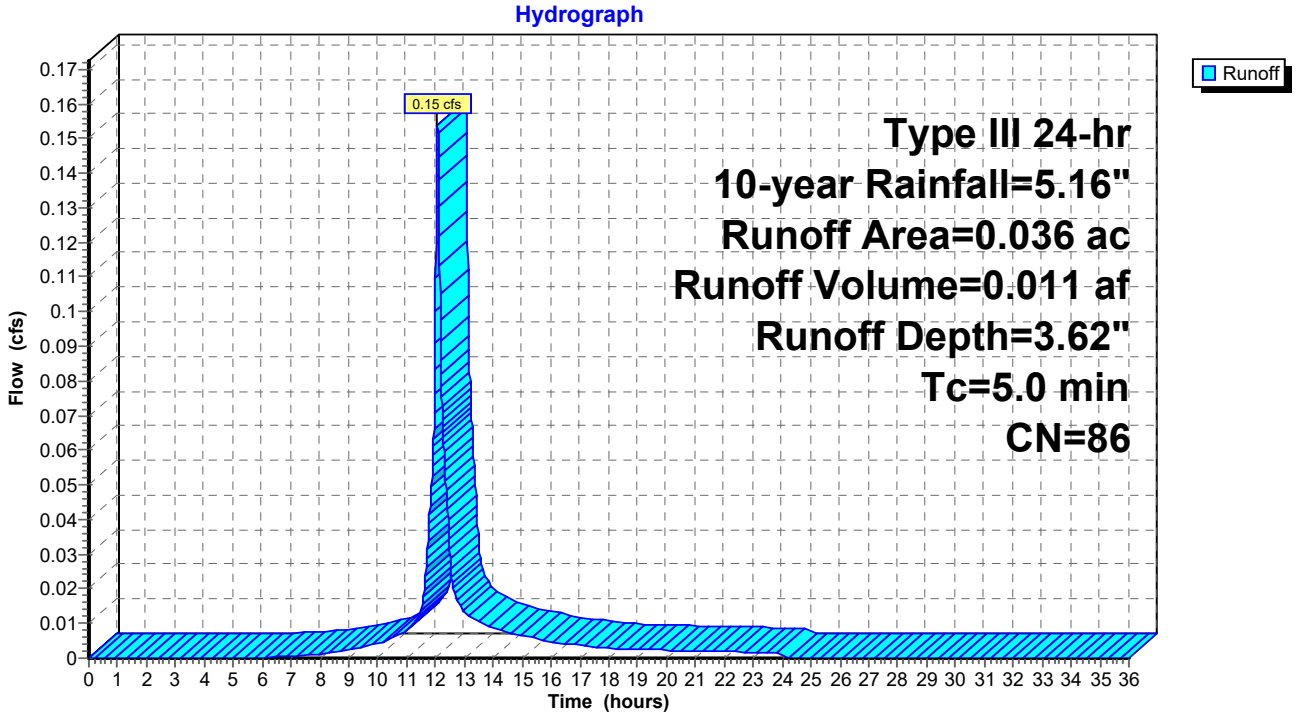
Runoff = 0.15 cfs @ 12.07 hrs, Volume= 0.011 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-year Rainfall=5.16"

Area (ac)	CN	Description
0.023	80	>75% Grass cover, Good, HSG D
0.013	98	Paved parking, HSG D
0.036	86	Weighted Average
0.023		64.04% Pervious Area
0.013		35.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-5: Front of Site



Summary for Pond 1P: Underground Detention MC 4500

Inflow Area = 0.590 ac, 99.85% Impervious, Inflow Depth = 4.66" for 10-year event
Inflow = 3.06 cfs @ 12.07 hrs, Volume= 0.229 af
Outflow = 1.15 cfs @ 12.29 hrs, Volume= 0.229 af, Atten= 62%, Lag= 12.9 min
Discarded = 0.06 cfs @ 7.96 hrs, Volume= 0.128 af
Primary = 1.09 cfs @ 12.29 hrs, Volume= 0.101 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 73.71' @ 12.29 hrs Surf.Area= 1,112 sf Storage= 3,510 cf

Plug-Flow detention time= 175.4 min calculated for 0.229 af (100% of inflow)
Center-of-Mass det. time= 175.5 min (921.3 - 745.9)

Volume	Invert	Avail.Storage	Storage Description
#1	69.10'	1,939 cf	**Custom Stage Data (Irregular)** Listed below 7,506 cf Overall - 2,659 cf Embedded = 4,847 cf x 40.0% Voids
#2	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#3	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#4	69.85'	611 cf	**ADS_StormTech MC-4500 b +Cap** x 5 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#5	69.85'	398 cf	**ADS_StormTech MC-4500 b +Cap** x 3 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
		4,598 cf	Total Available Storage

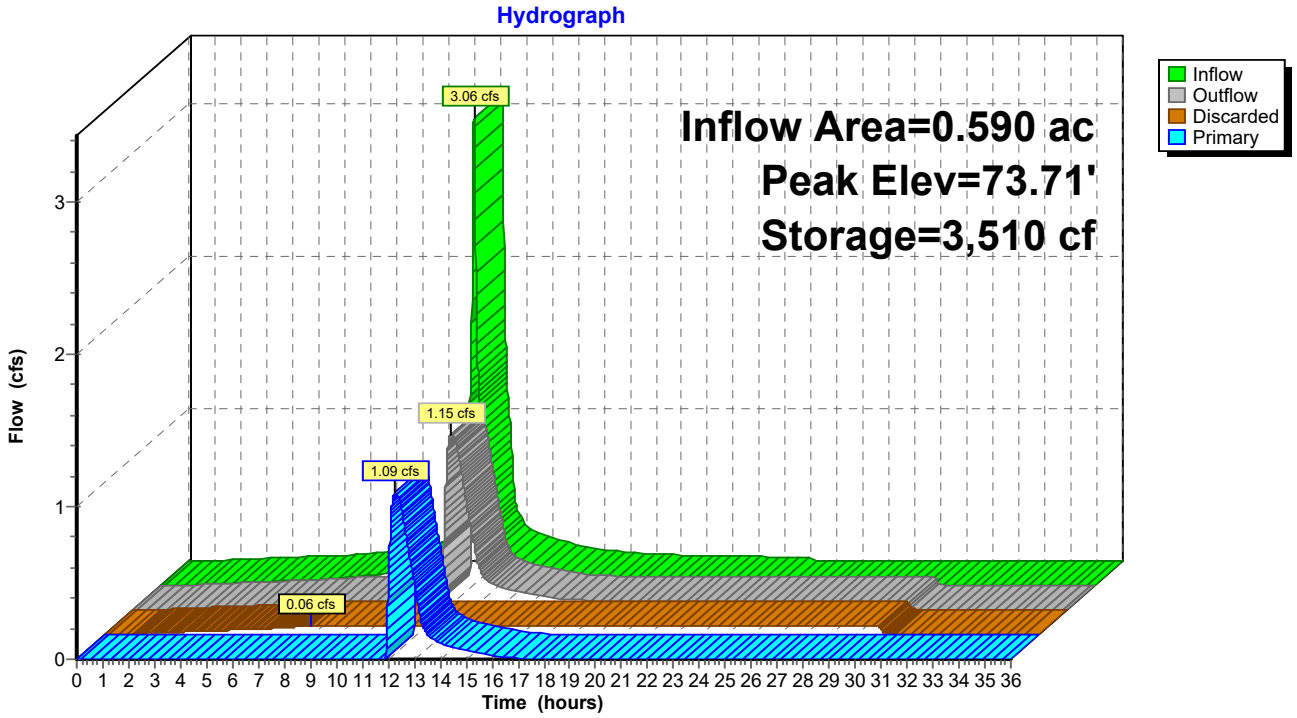
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.10	1,112	146.5	0	0	1,112
75.85	1,112	146.5	7,506	7,506	2,101

Device	Routing	Invert	Outlet Devices
#1	Primary	71.70'	**12.0" Round Culvert** L= 15.8' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 71.70' / 71.60' S= 0.0063 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	71.70'	**6.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	73.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	75.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Discarded	69.10'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 7.96 hrs HW=69.17' (Free Discharge)
└─**5=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.09 cfs @ 12.29 hrs HW=73.71' (Free Discharge)
└─**1=Culvert** (Passes 1.09 cfs of 4.64 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 6.53 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.30 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Underground Detention MC 4500



Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 4.92" for 10-year event
Inflow = 0.35 cfs @ 12.07 hrs, Volume= 0.027 af
Outflow = 0.34 cfs @ 12.08 hrs, Volume= 0.027 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.013 af
Primary = 0.33 cfs @ 12.08 hrs, Volume= 0.015 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 76.35' @ 12.08 hrs Surf.Area= 227 sf Storage= 87 cf

Plug-Flow detention time= 45.8 min calculated for 0.027 af (100% of inflow)
Center-of-Mass det. time= 45.8 min (792.4 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1	75.50'	127 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

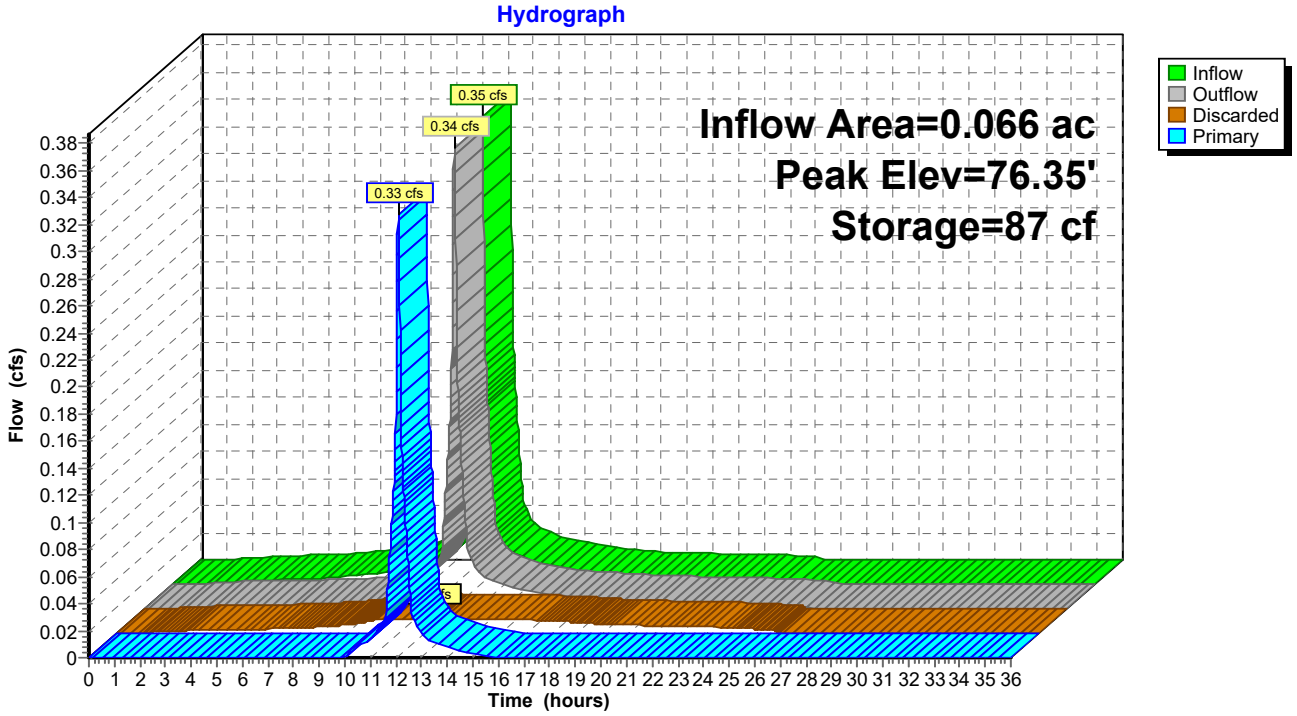
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.50	41	32.2	0	0	41
76.10	115	45.3	45	45	125
76.50	312	83.9	82	127	523

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**12.0" Round Culvert** L= 15.9' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 72.00' / 71.50' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	76.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Discarded	75.50'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=76.35' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.33 cfs @ 12.08 hrs HW=76.35' TW=75.72' (Fixed TW Elev= 75.72')
└**1=Culvert** (Passes 0.33 cfs of 3.00 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.33 cfs @ 1.04 fps)

Pond 2P: Bioretention Basin

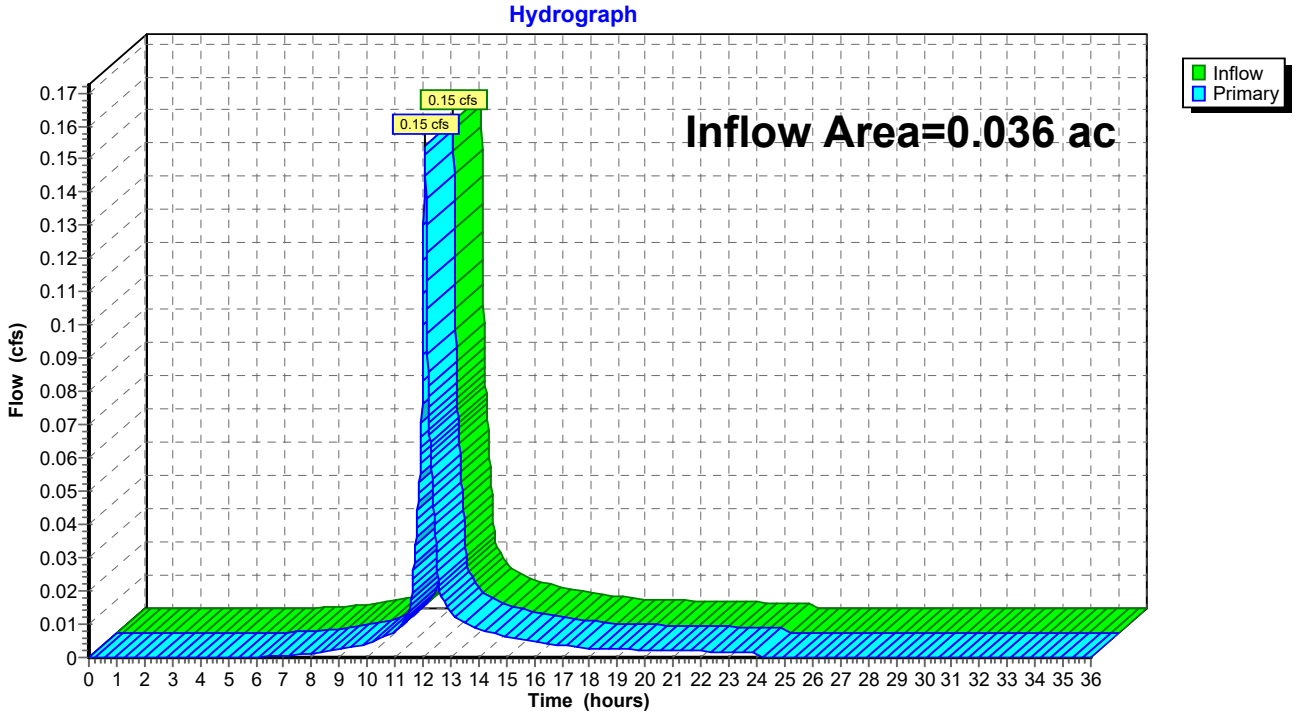


Summary for Link DP-1: Dudley Street

Inflow Area = 0.036 ac, 35.96% Impervious, Inflow Depth = 3.62" for 10-year event
Inflow = 0.15 cfs @ 12.07 hrs, Volume= 0.011 af
Primary = 0.15 cfs @ 12.07 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

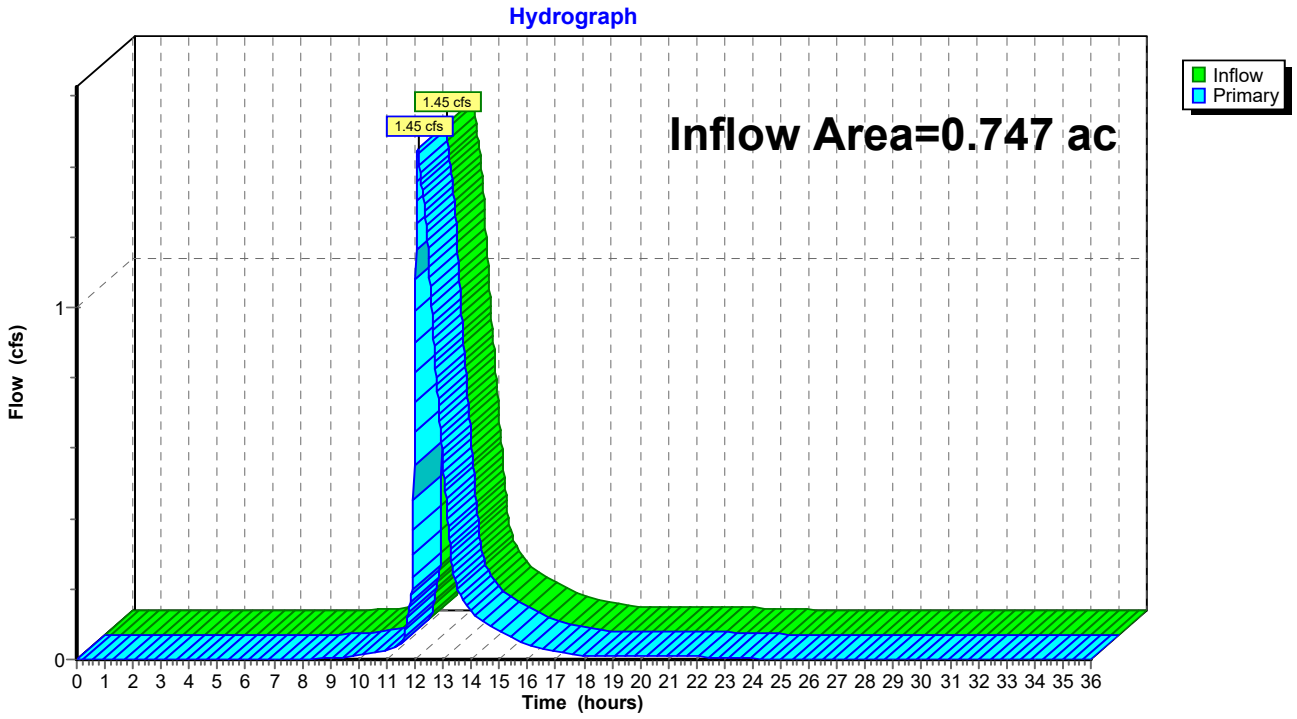


Summary for Link DP-2: Mill Brook

Inflow Area = 0.747 ac, 79.04% Impervious, Inflow Depth = 2.26" for 10-year event
Inflow = 1.45 cfs @ 12.11 hrs, Volume= 0.141 af
Primary = 1.45 cfs @ 12.11 hrs, Volume= 0.141 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



25-Year Storm Event – Proposed

Summary for Subcatchment PR-1: Roof

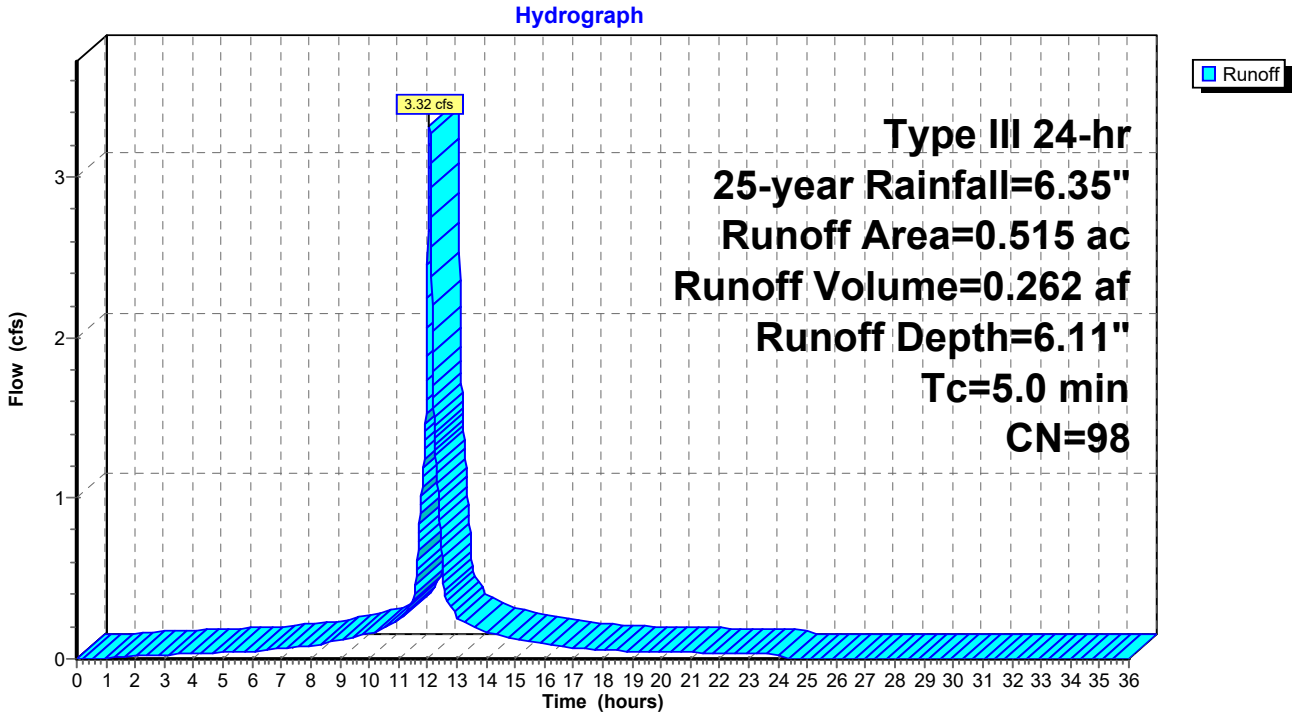
Runoff = 3.32 cfs @ 12.07 hrs, Volume= 0.262 af, Depth= 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.515	98	Roofs, HSG D
0.515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-1: Roof



Summary for Subcatchment PR-2: Back Pervious

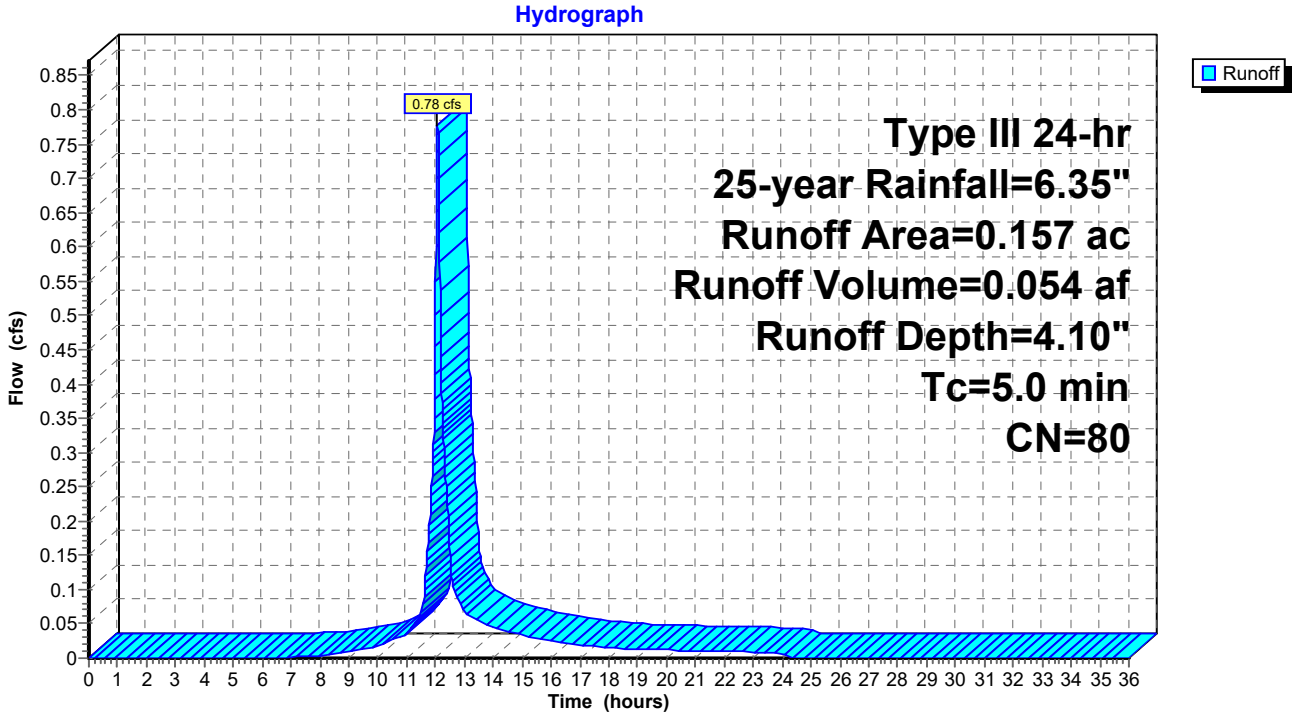
Runoff = 0.78 cfs @ 12.07 hrs, Volume= 0.054 af, Depth= 4.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.156	80	>75% Grass cover, Good, HSG D
0.001	98	Paved parking, HSG D
0.157	80	Weighted Average
0.156		99.07% Pervious Area
0.001		0.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-2: Back Pervious



Summary for Subcatchment PR-3: Pavement

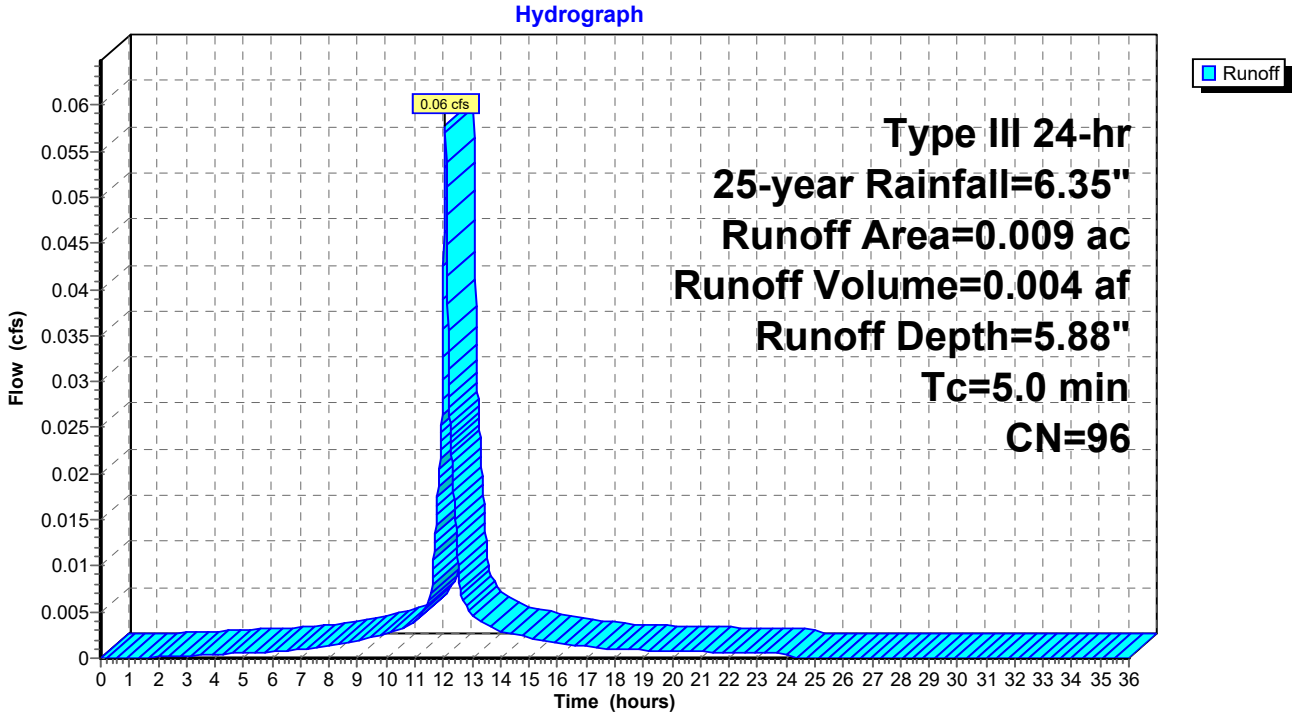
Runoff = 0.06 cfs @ 12.07 hrs, Volume= 0.004 af, Depth= 5.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.001	80	>75% Grass cover, Good, HSG D
0.008	98	Paved parking, HSG D
0.009	96	Weighted Average
0.001		10.00% Pervious Area
0.008		90.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-3: Pavement



Summary for Subcatchment PR-4: Pavement

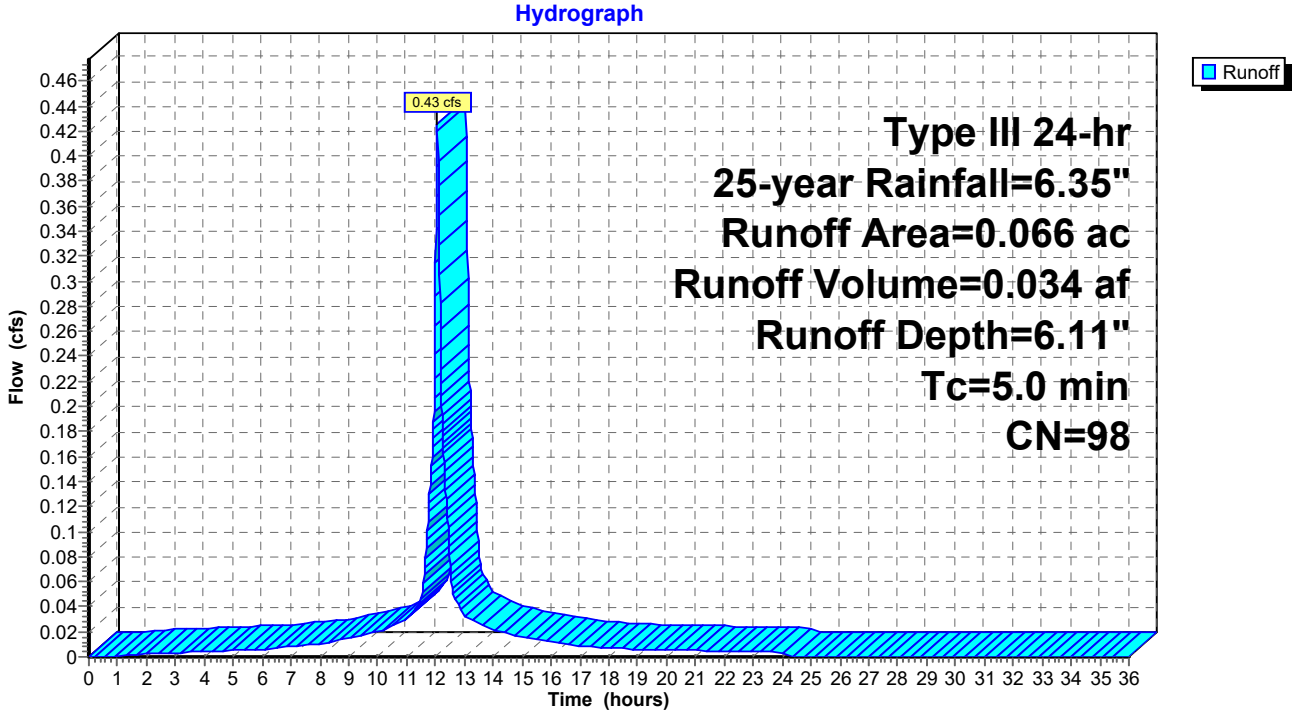
Runoff = 0.43 cfs @ 12.07 hrs, Volume= 0.034 af, Depth= 6.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.066	98	Paved parking, HSG D
0.066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-4: Pavement



Summary for Subcatchment PR-5: Front of Site

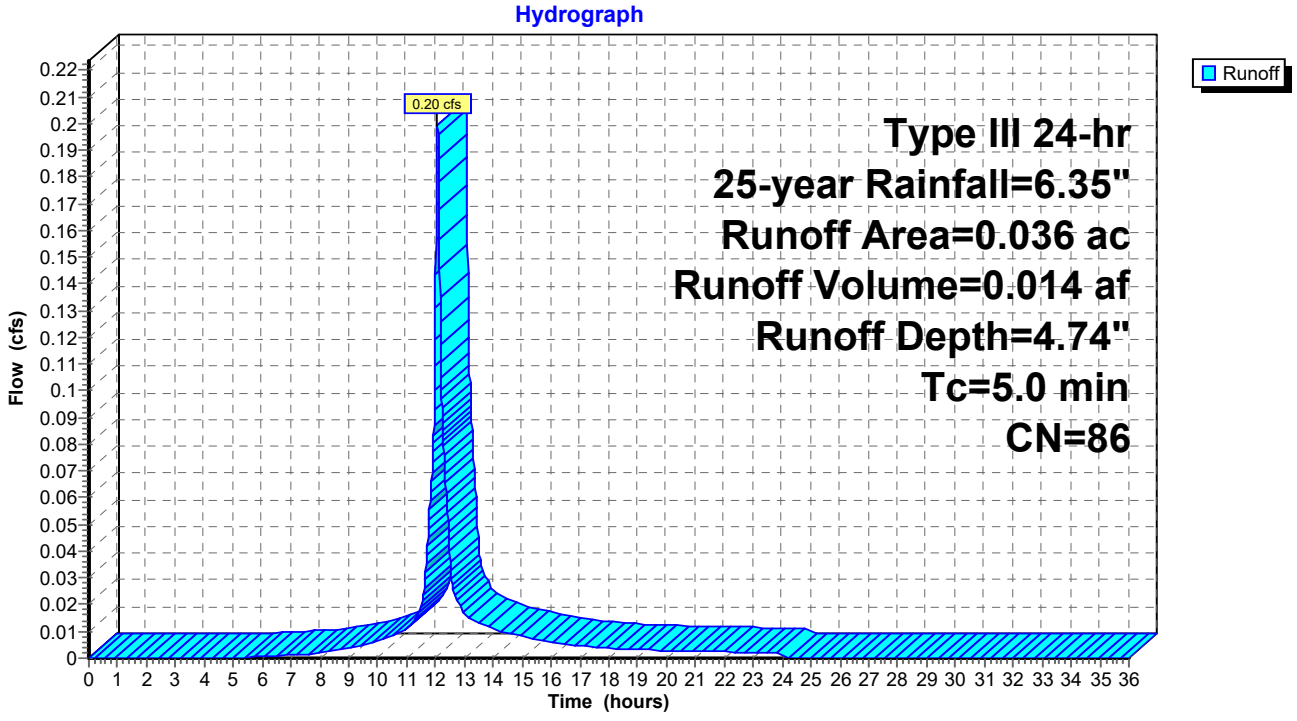
Runoff = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-year Rainfall=6.35"

Area (ac)	CN	Description
0.023	80	>75% Grass cover, Good, HSG D
0.013	98	Paved parking, HSG D
0.036	86	Weighted Average
0.023		64.04% Pervious Area
0.013		35.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-5: Front of Site



Summary for Pond 1P: Underground Detention MC 4500

Inflow Area = 0.590 ac, 99.85% Impervious, Inflow Depth = 5.82" for 25-year event
Inflow = 3.78 cfs @ 12.07 hrs, Volume= 0.286 af
Outflow = 2.04 cfs @ 12.18 hrs, Volume= 0.286 af, Atten= 46%, Lag= 6.7 min
Discarded = 0.06 cfs @ 7.04 hrs, Volume= 0.138 af
Primary = 1.97 cfs @ 12.18 hrs, Volume= 0.149 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 74.47' @ 12.18 hrs Surf.Area= 1,112 sf Storage= 3,973 cf

Plug-Flow detention time= 157.9 min calculated for 0.286 af (100% of inflow)
Center-of-Mass det. time= 157.9 min (900.6 - 742.7)

Volume	Invert	Avail.Storage	Storage Description
#1	69.10'	1,939 cf	**Custom Stage Data (Irregular)** Listed below 7,506 cf Overall - 2,659 cf Embedded = 4,847 cf x 40.0% Voids
#2	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#3	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#4	69.85'	611 cf	**ADS_StormTech MC-4500 b +Cap** x 5 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#5	69.85'	398 cf	**ADS_StormTech MC-4500 b +Cap** x 3 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
		4,598 cf	Total Available Storage

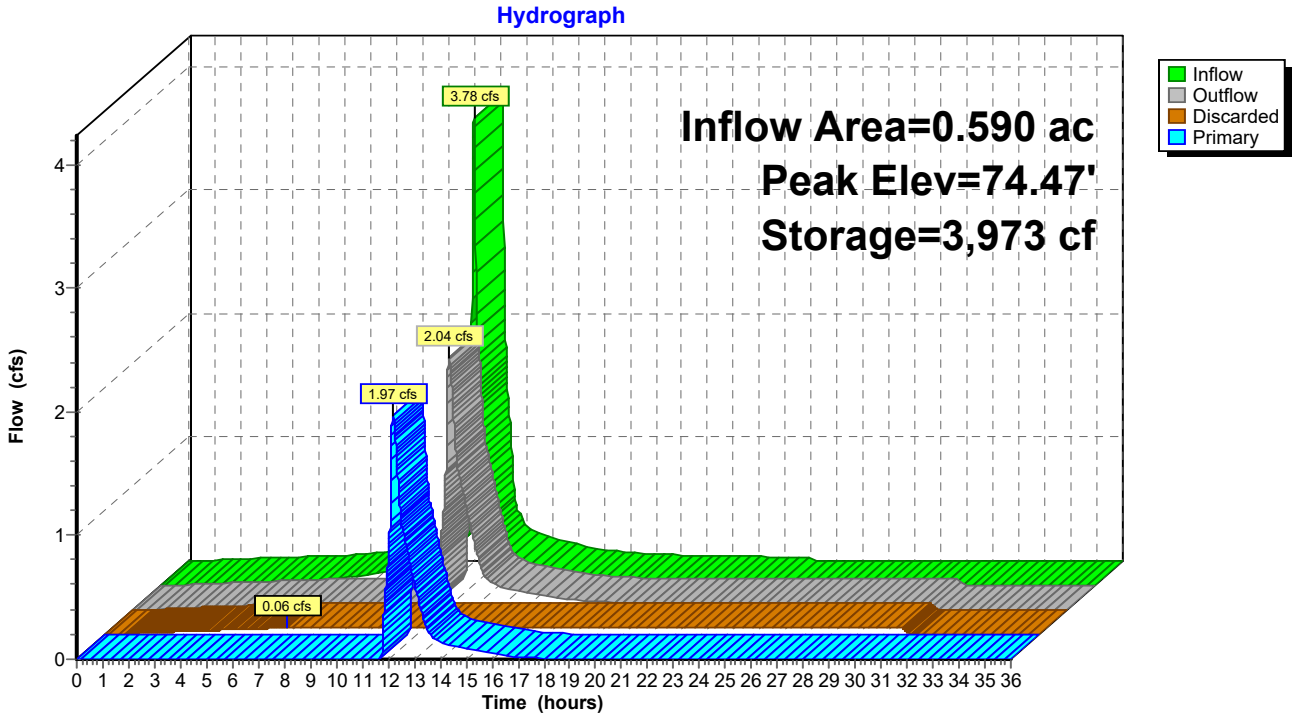
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.10	1,112	146.5	0	0	1,112
75.85	1,112	146.5	7,506	7,506	2,101

Device	Routing	Invert	Outlet Devices
#1	Primary	71.70'	**12.0" Round Culvert** L= 15.8' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 71.70' / 71.60' S= 0.0063 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	71.70'	**6.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	73.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	75.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Discarded	69.10'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 7.04 hrs HW=69.17' (Free Discharge)
└─**5=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=1.97 cfs @ 12.18 hrs HW=74.47' (Free Discharge)
└─**1=Culvert** (Passes 1.97 cfs of 5.70 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 1.29 cfs @ 7.76 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.68 cfs @ 3.47 fps)
  └─**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Underground Detention MC 4500



Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 6.11" for 25-year event
Inflow = 0.43 cfs @ 12.07 hrs, Volume= 0.034 af
Outflow = 0.42 cfs @ 12.08 hrs, Volume= 0.034 af, Atten= 1%, Lag= 0.7 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.014 af
Primary = 0.41 cfs @ 12.08 hrs, Volume= 0.020 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 76.37' @ 12.08 hrs Surf.Area= 235 sf Storage= 91 cf

Plug-Flow detention time= 42.5 min calculated for 0.034 af (100% of inflow)
Center-of-Mass det. time= 42.6 min (786.0 - 743.4)

Volume	Invert	Avail.Storage	Storage Description
#1	75.50'	127 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

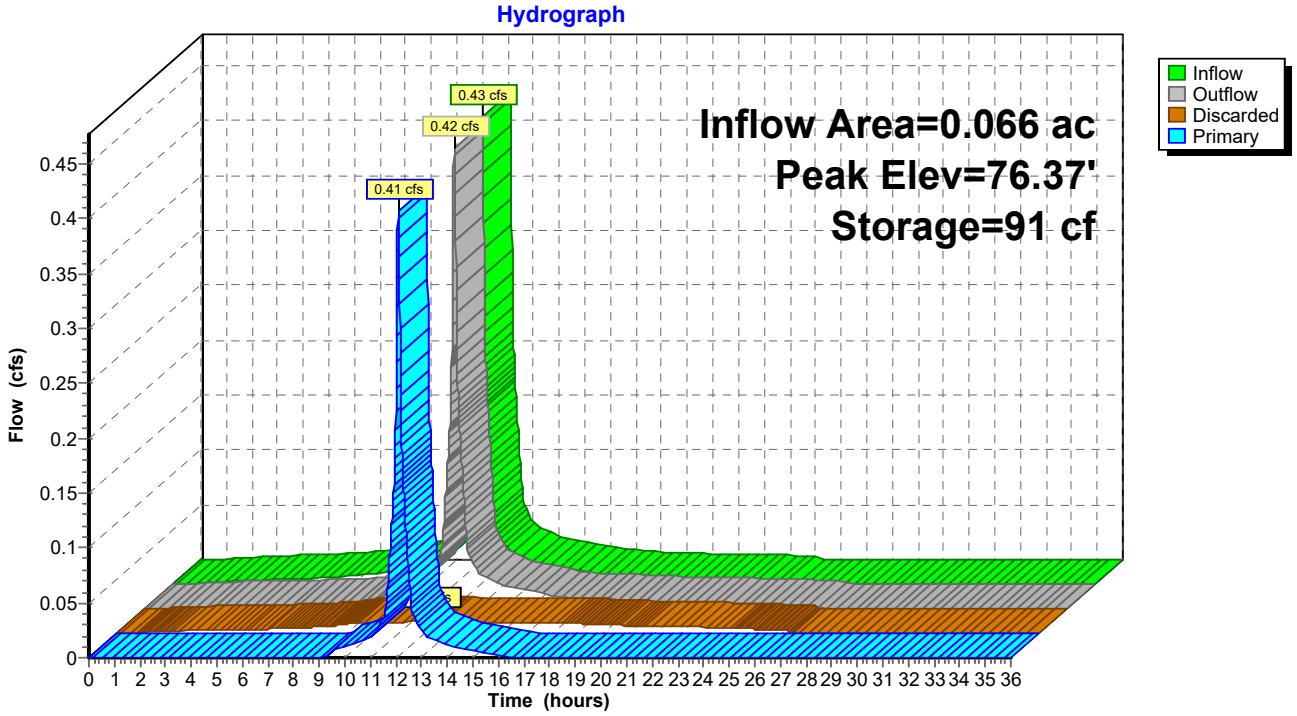
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.50	41	32.2	0	0	41
76.10	115	45.3	45	45	125
76.50	312	83.9	82	127	523

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**12.0" Round Culvert** L= 15.9' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 72.00' / 71.50' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	76.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Discarded	75.50'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=76.37' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.41 cfs @ 12.08 hrs HW=76.37' TW=75.72' (Fixed TW Elev= 75.72')
└**1=Culvert** (Passes 0.41 cfs of 3.04 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.41 cfs @ 1.11 fps)

Pond 2P: Bioretention Basin

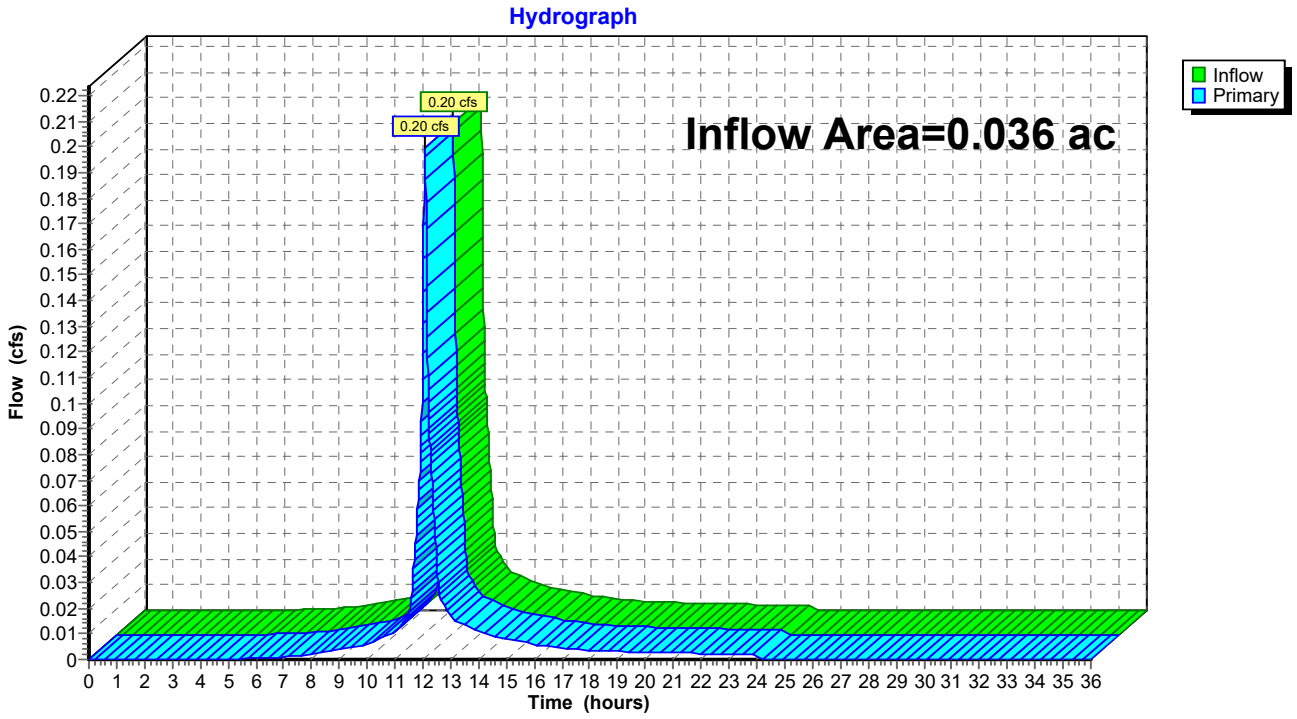


Summary for Link DP-1: Dudley Street

Inflow Area = 0.036 ac, 35.96% Impervious, Inflow Depth = 4.74" for 25-year event
Inflow = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af
Primary = 0.20 cfs @ 12.07 hrs, Volume= 0.014 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

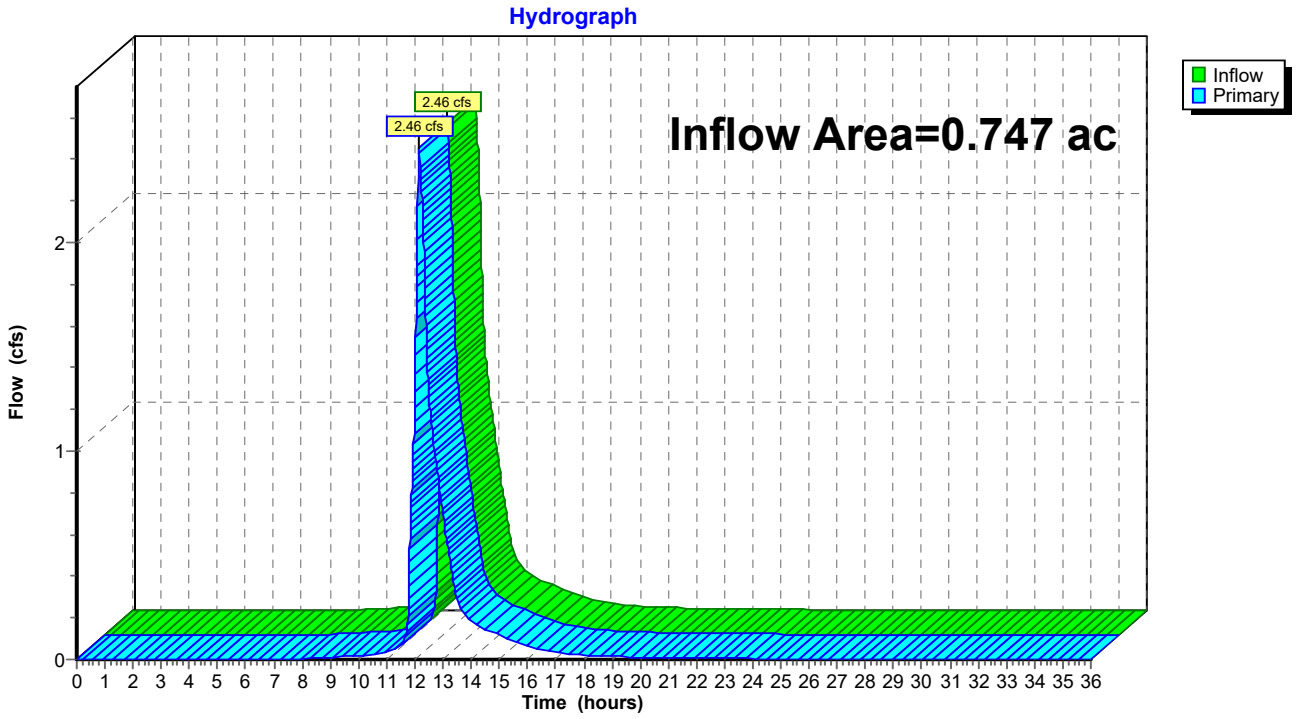


Summary for Link DP-2: Mill Brook

Inflow Area = 0.747 ac, 79.04% Impervious, Inflow Depth = 3.25" for 25-year event
Inflow = 2.46 cfs @ 12.15 hrs, Volume= 0.202 af
Primary = 2.46 cfs @ 12.15 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



100-Year Storm Event – Proposed

Summary for Subcatchment PR-1: Roof

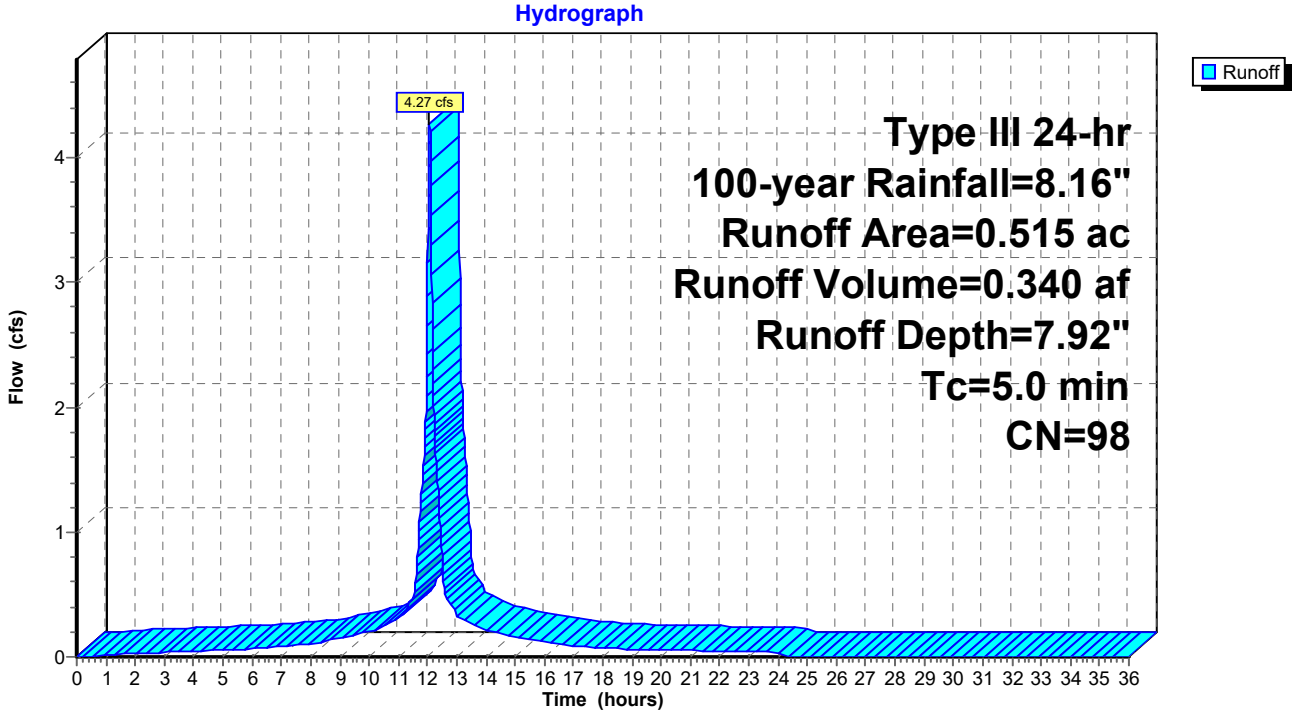
Runoff = 4.27 cfs @ 12.07 hrs, Volume= 0.340 af, Depth= 7.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.515	98	Roofs, HSG D
0.515		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-1: Roof



Summary for Subcatchment PR-2: Back Pervious

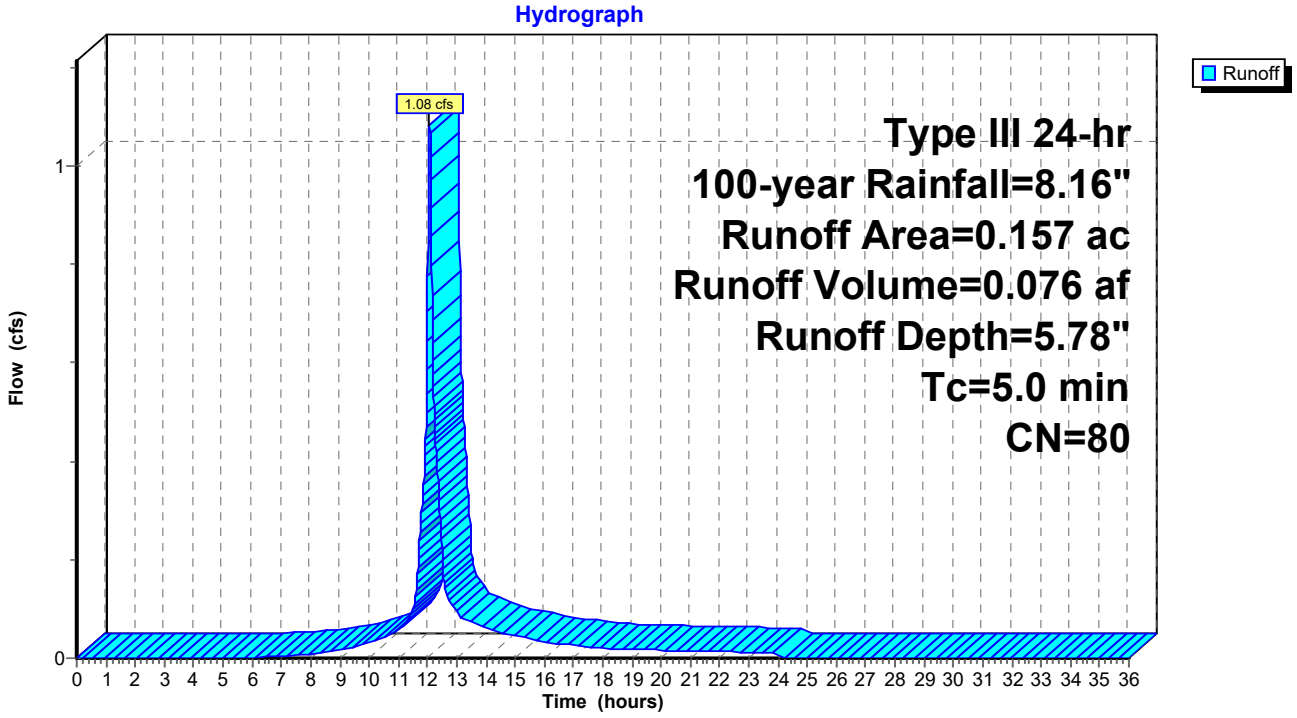
Runoff = 1.08 cfs @ 12.07 hrs, Volume= 0.076 af, Depth= 5.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.156	80	>75% Grass cover, Good, HSG D
0.001	98	Paved parking, HSG D
0.157	80	Weighted Average
0.156		99.07% Pervious Area
0.001		0.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-2: Back Pervious



Summary for Subcatchment PR-3: Pavement

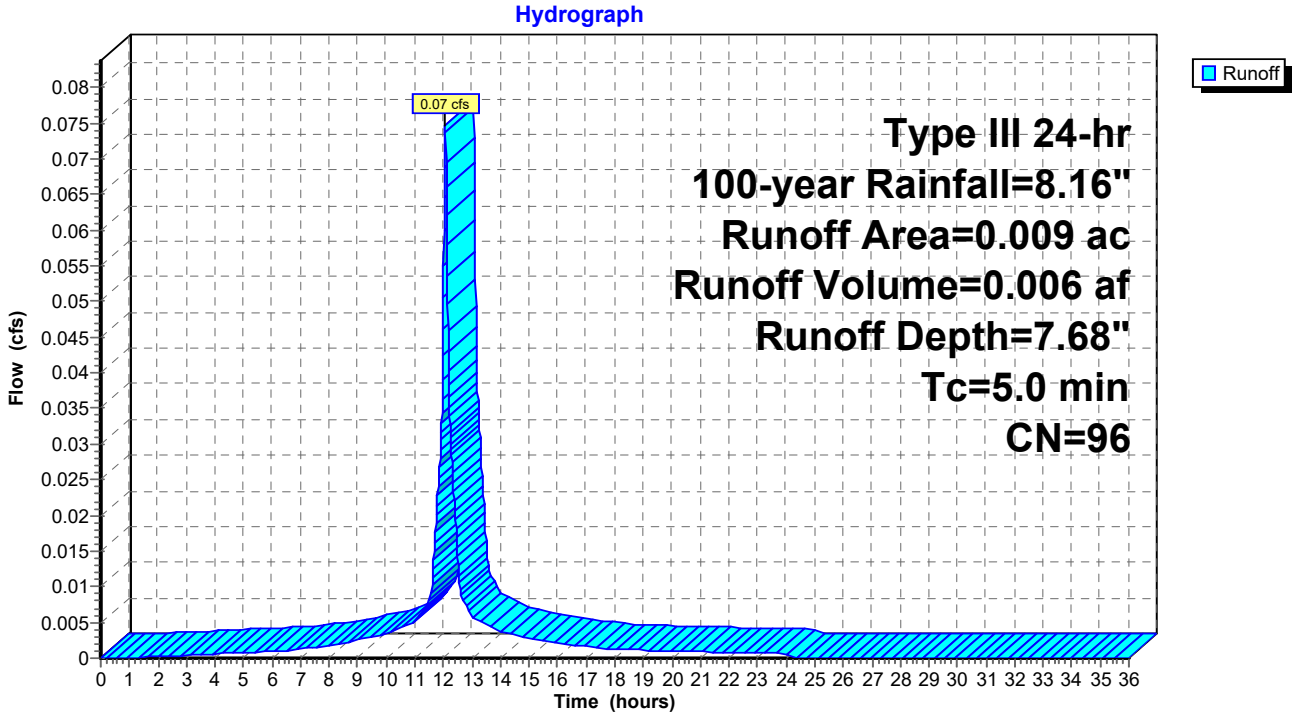
Runoff = 0.07 cfs @ 12.07 hrs, Volume= 0.006 af, Depth= 7.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.001	80	>75% Grass cover, Good, HSG D
0.008	98	Paved parking, HSG D
0.009	96	Weighted Average
0.001		10.00% Pervious Area
0.008		90.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-3: Pavement



Summary for Subcatchment PR-4: Pavement

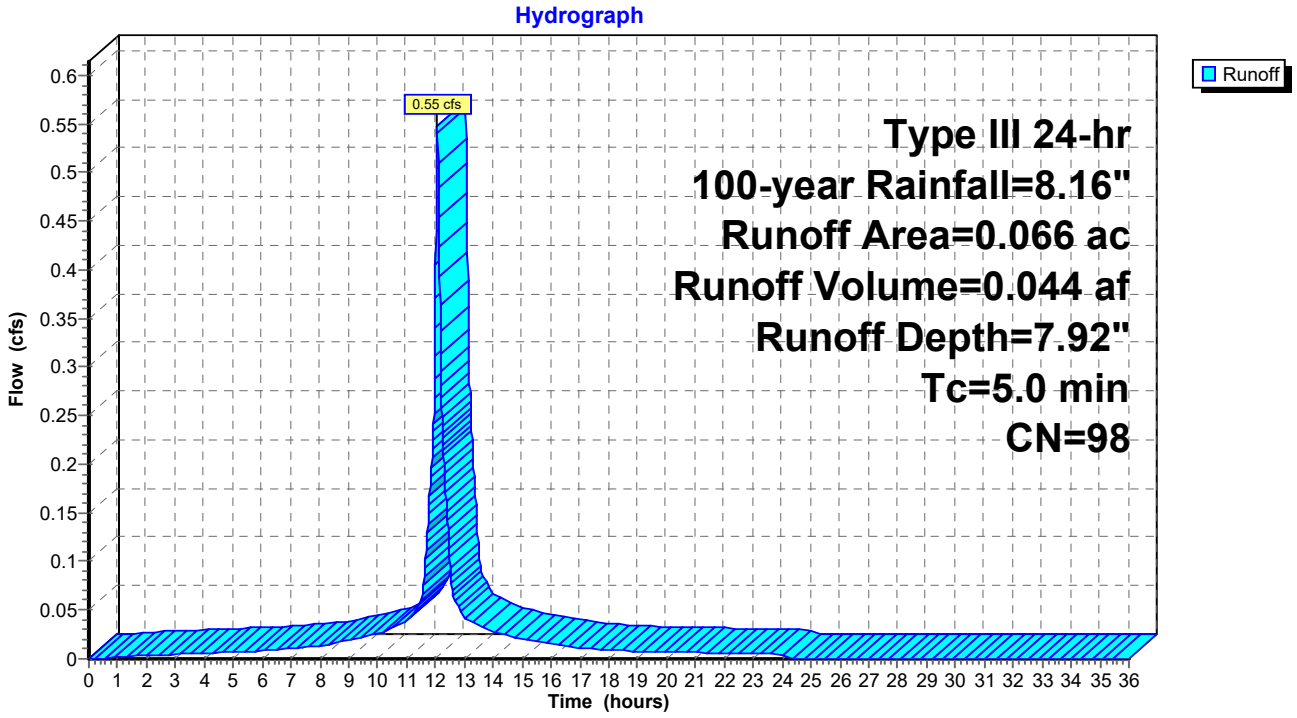
Runoff = 0.55 cfs @ 12.07 hrs, Volume= 0.044 af, Depth= 7.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.066	98	Paved parking, HSG D
0.066		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-4: Pavement



Summary for Subcatchment PR-5: Front of Site

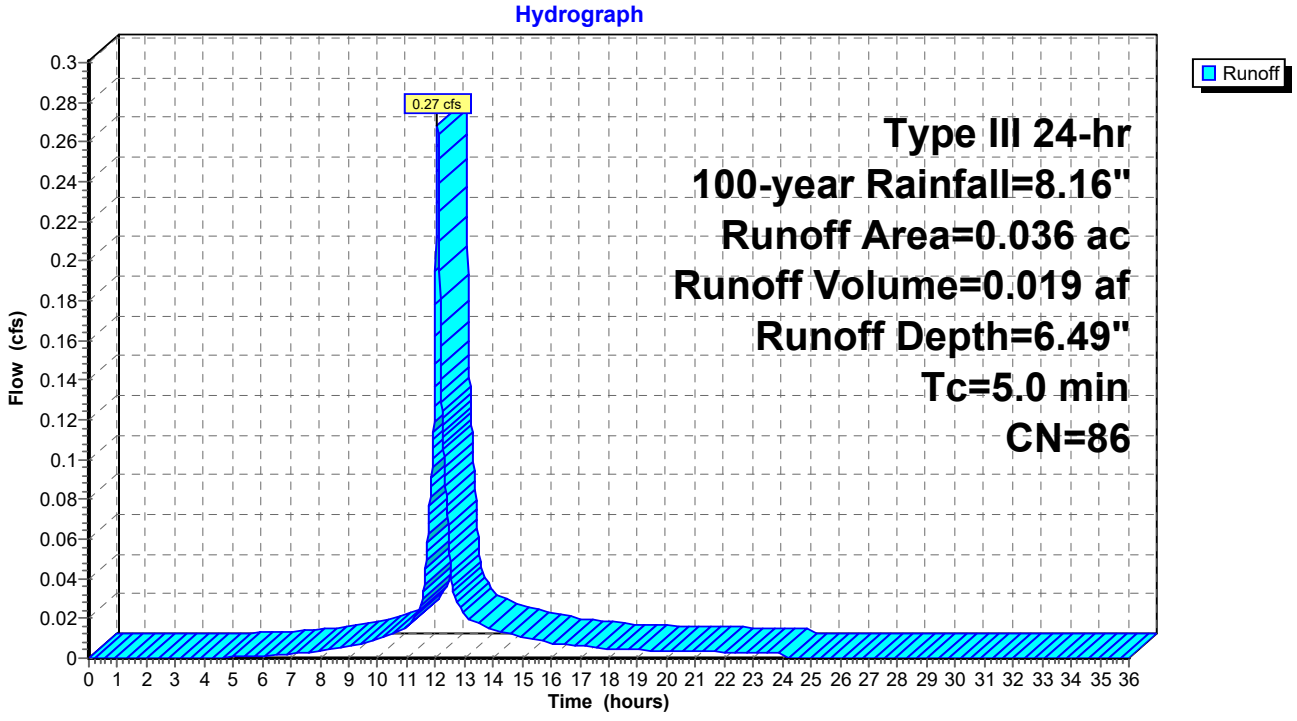
Runoff = 0.27 cfs @ 12.07 hrs, Volume= 0.019 af, Depth= 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-year Rainfall=8.16"

Area (ac)	CN	Description
0.023	80	>75% Grass cover, Good, HSG D
0.013	98	Paved parking, HSG D
0.036	86	Weighted Average
0.023		64.04% Pervious Area
0.013		35.96% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment PR-5: Front of Site



Summary for Pond 1P: Underground Detention MC 4500

Inflow Area = 0.590 ac, 99.85% Impervious, Inflow Depth = 7.59" for 100-year event
Inflow = 4.87 cfs @ 12.07 hrs, Volume= 0.373 af
Outflow = 2.93 cfs @ 12.16 hrs, Volume= 0.373 af, Atten= 40%, Lag= 5.6 min
Discarded = 0.06 cfs @ 5.97 hrs, Volume= 0.149 af
Primary = 2.87 cfs @ 12.16 hrs, Volume= 0.225 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 75.79' @ 12.16 hrs Surf.Area= 1,112 sf Storage= 4,570 cf

Plug-Flow detention time= 139.0 min calculated for 0.373 af (100% of inflow)
Center-of-Mass det. time= 138.9 min (878.4 - 739.5)

Volume	Invert	Avail.Storage	Storage Description
#1	69.10'	1,939 cf	**Custom Stage Data (Irregular)** Listed below 7,506 cf Overall - 2,659 cf Embedded = 4,847 cf x 40.0% Voids
#2	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#3	69.85'	824 cf	**ADS_StormTech MC-4500 b +Cap** x 7 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#4	69.85'	611 cf	**ADS_StormTech MC-4500 b +Cap** x 5 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
#5	69.85'	398 cf	**ADS_StormTech MC-4500 b +Cap** x 3 Inside #1 Effective Size= 90.4"W x 60.0"H => 26.46 sf x 4.03'L = 106.5 cf Overall Size= 100.0"W x 60.0"H x 4.33'L with 0.31' Overlap Cap Storage= +39.5 cf x 2 x 1 rows = 79.0 cf
		4,598 cf	Total Available Storage

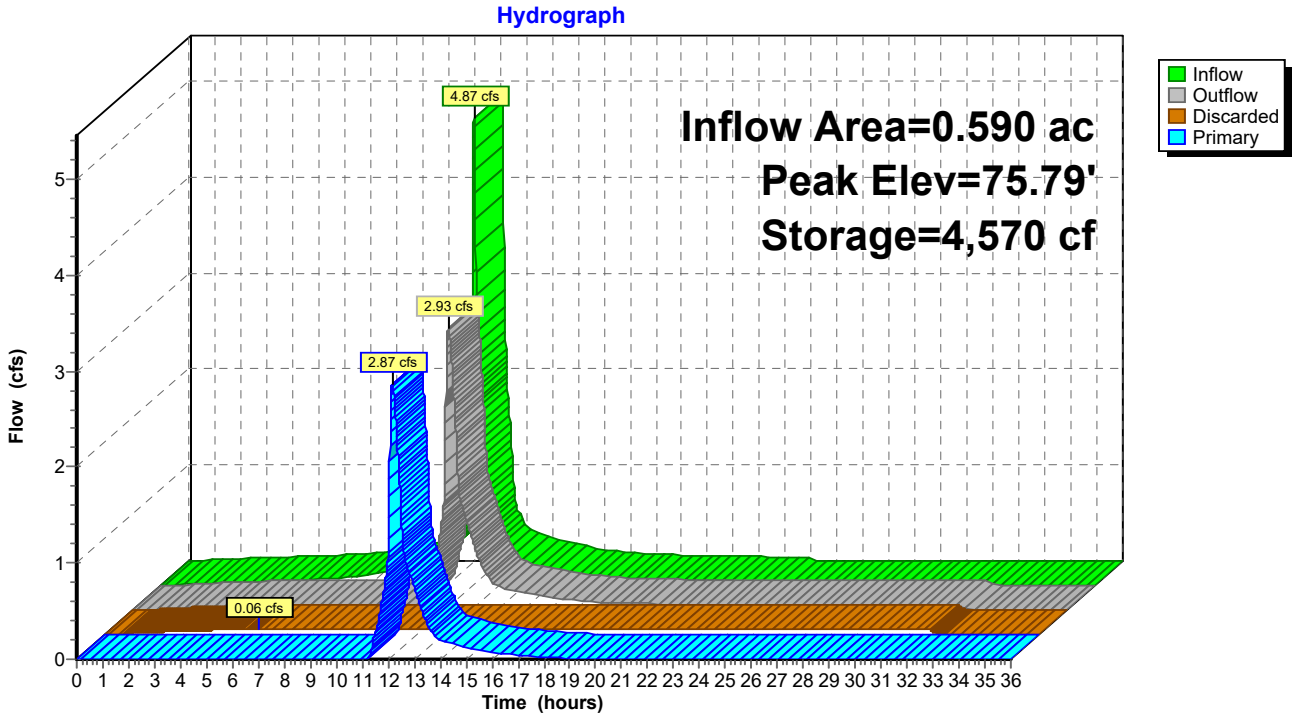
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
69.10	1,112	146.5	0	0	1,112
75.85	1,112	146.5	7,506	7,506	2,101

Device	Routing	Invert	Outlet Devices
#1	Primary	71.70'	**12.0" Round Culvert** L= 15.8' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 71.70' / 71.60' S= 0.0063 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	71.70'	**6.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	73.70'	**6.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Device 1	75.80'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#5	Discarded	69.10'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.06 cfs @ 5.97 hrs HW=69.17' (Free Discharge)
└**5=Exfiltration** (Exfiltration Controls 0.06 cfs)

Primary OutFlow Max=2.87 cfs @ 12.16 hrs HW=75.78' (Free Discharge)
└**1=Culvert** (Passes 2.87 cfs of 7.16 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 9.53 fps)
  ├**3=Orifice/Grate** (Orifice Controls 1.28 cfs @ 6.52 fps)
  └**4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Underground Detention MC 4500



Summary for Pond 2P: Bioretention Basin

Inflow Area = 0.066 ac,100.00% Impervious, Inflow Depth = 7.92" for 100-year event
Inflow = 0.55 cfs @ 12.07 hrs, Volume= 0.044 af
Outflow = 0.54 cfs @ 12.08 hrs, Volume= 0.044 af, Atten= 1%, Lag= 0.7 min
Discarded = 0.01 cfs @ 12.08 hrs, Volume= 0.016 af
Primary = 0.53 cfs @ 12.08 hrs, Volume= 0.028 af

Routing by Stor-Ind method, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs
Peak Elev= 76.39' @ 12.08 hrs Surf.Area= 247 sf Storage= 96 cf

Plug-Flow detention time= 38.2 min calculated for 0.044 af (100% of inflow)
Center-of-Mass det. time= 38.2 min (778.2 - 740.0)

Volume	Invert	Avail.Storage	Storage Description
#1	75.50'	127 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

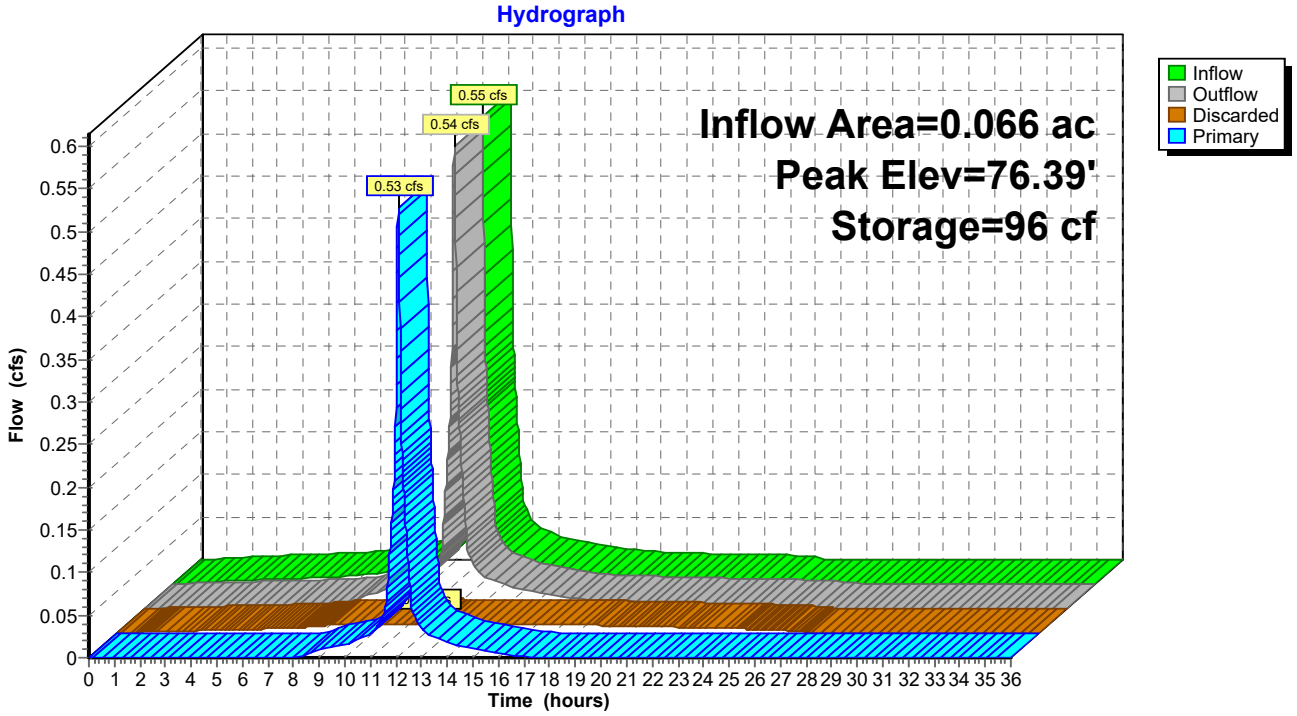
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
75.50	41	32.2	0	0	41
76.10	115	45.3	45	45	125
76.50	312	83.9	82	127	523

Device	Routing	Invert	Outlet Devices
#1	Primary	72.00'	**12.0" Round Culvert** L= 15.9' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 72.00' / 71.50' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	76.25'	**12.0" Horiz. Orifice/Grate** C= 0.600 in 12.0" Grate (100% open area) Limited to weir flow at low heads
#3	Discarded	75.50'	**2.400 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.01 cfs @ 12.08 hrs HW=76.39' (Free Discharge)
└**3=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.53 cfs @ 12.08 hrs HW=76.39' TW=75.72' (Fixed TW Elev= 75.72')
└**1=Culvert** (Passes 0.53 cfs of 3.09 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.53 cfs @ 1.21 fps)

Pond 2P: Bioretention Basin

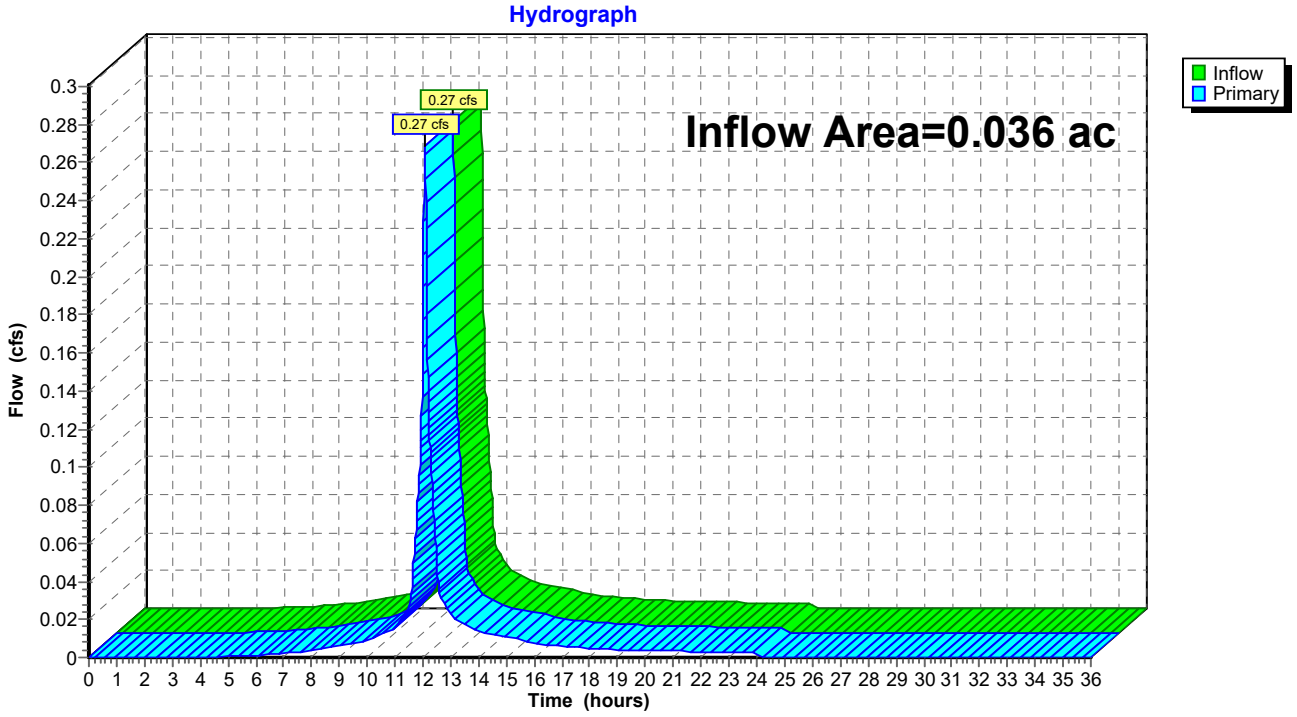


Summary for Link DP-1: Dudley Street

Inflow Area = 0.036 ac, 35.96% Impervious, Inflow Depth = 6.49" for 100-year event
Inflow = 0.27 cfs @ 12.07 hrs, Volume= 0.019 af
Primary = 0.27 cfs @ 12.07 hrs, Volume= 0.019 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-1: Dudley Street

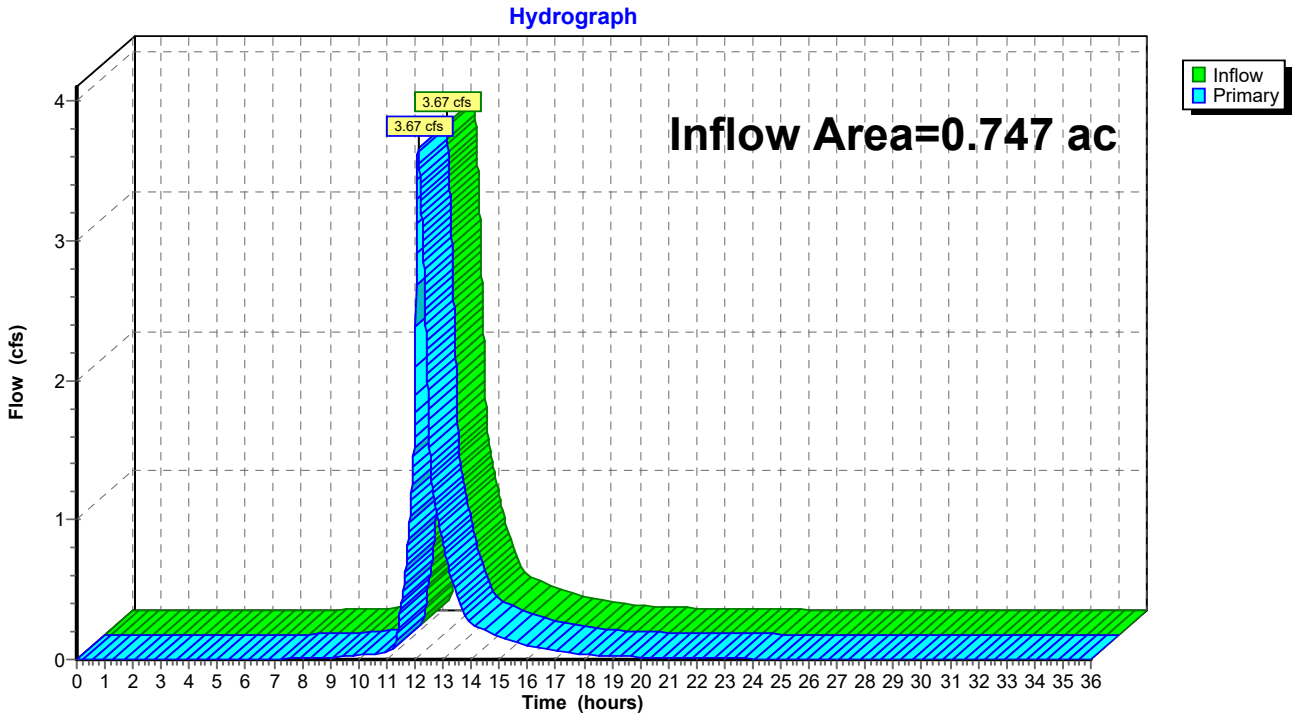


Summary for Link DP-2: Mill Brook

Inflow Area = 0.747 ac, 79.04% Impervious, Inflow Depth = 4.83" for 100-year event
Inflow = 3.67 cfs @ 12.12 hrs, Volume= 0.301 af
Primary = 3.67 cfs @ 12.12 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-36.00 hrs, dt= 0.01 hrs

Link DP-2: Mill Brook



This page intentionally left blank.

Appendix C: Standard 3 Computations and Supporting Documentation

- Geotechnical Report (GeoEngineers Inc., dated January 28, 2022)
- Recharge Volume Calculations
- 72 hour drawdown analysis

Geotechnical Report

GeoEngineers USA
239 Causeway Street, Suite 105
Boston, Massachusetts 02114
617.749.9214

January 28, 2022

PSI Atlantic Arlington Massachusetts LLC
530 Oak Court Drive, Suite 155
Memphis, Tennessee 38117

Attention: Jay Tillman and Jesse Morgan

Subject: Geotechnical Engineering Letter Report
34 Dudley Street
Arlington, Massachusetts
File No. 25754-001-00

GeoEngineers USA, PC (GeoEngineers) is pleased to provide this geotechnical engineering letter report to PSI Atlantic Arlington MA, LLC (PSI) for the proposed redevelopment for the property located at 34 Dudley Street in Arlington, Massachusetts (Site), as shown on Figure 1, Site Locus Map. This letter report is subject to the limitations attached herein.

SITE AND PROJECT DESCRIPTION

The existing site is comprised of a one to two story autobody shop and glass repair shop with a one-story garage located in the southwestern portion of the site and associated paved parking areas. As shown on Figure 2, Exploration Location Plan, the southern portion of the site slopes down to Mill Brook. GeoEngineers observed that portions of the slope have failed or are in poor condition.

Based on our conversations with you and the concept plans provided by VHB, Inc. (VHB), dated November 3, 2021, we understand the project consists of razing the existing structure to allow for the construction of a 5-story self-storage facility with a footprint of approximately 20,000 square feet and associated parking areas and drive aisles. Based on the grading plan we received on January 25, 2022, we understand the building will have a proposed finished floor elevation (FFE) of elevation (El.) 79 feet and will be constructed at-grade without a basement. The site plans indicate that the upper portion of the slope along Mill Brook will be re-graded as part of the redevelopment. A stormwater infiltration system with a bottom of stone invert of El. 69.1 feet is also proposed in the northwestern portion of the Site, as shown on Figure 2.

Existing grades at the site vary between approximately El. 76 feet at the crest of the southern slope by Mill Brook and approximately El. 81 feet in the upper parking lot in the northern portion of the Site. Ground surface elevations in this memorandum are referenced to the North American Vertical Datum of 1988 (NAVD) and elevations are based on interpreting the existing conditions plans by VHB dated October 28, 2021.

SUBSURFACE EXPLORATION PROGRAM

The subsurface exploration program consisted of advancing six borings to depths between approximately 7 to 25 feet below existing ground surface (bgs). The boring program was completed between December 9, 2021, and January 8, 2022. The boring program was designed to meet the intent of the Town of Arlington zoning bylaw for redevelopments residing in the Inland Wetland District (Section 5.8.6 Development Conditions – subsection A.1). In addition, explorations were coordinated with the project environmental consultant, The Vertex Companies (Vertex) of Boston, Massachusetts as part of their Phase I Environmental Site Assessment (ESA). The approximate locations of the explorations are shown on Figure 2 and logs are provided in Attachment A.

Borings were advanced by Crawford Drilling Services, LLC (CDS) of Westminster, Massachusetts on December 18, 2021 using a truck-mounted drill rig equipped with hollow-stem augers and by G&M Subsurface on December 9, 2021 and January 8, 2022 using direct-push drilling methods. The boring programs were continuously observed by a representative from GeoEngineers who examined and classified the soils encountered, obtained representative soil samples, observed groundwater conditions (if present) and prepared a detailed log of each exploration. Soil samples were collected at 5-foot intervals with a 2-inch outside-diameter split-barrel standard penetration test (SPT) sampler. The blow counts are shown on the boring logs at the respective sample depths.

Soils encountered in the borings were visually classified in general accordance with the classification system described in Figure A-1. A key to the boring log symbols is also presented in Figure A-1. The logs of the borings are presented in Figures A-2 through A-7. The boring logs are based on our interpretation of the field and laboratory data and indicate the various types of soils encountered. The logs also indicate the depths at which these soils or their characteristics change, although the changes may actually be gradual. If the change occurred between samples, it was interpreted. The densities noted on the boring logs are based on the blow count data obtained in the borings and judgment based on the conditions encountered.

Geotechnical Laboratory Analysis

Three soil samples, from borings designated GEO-3, GEO-5, and GEO-6, were submitted to Thielsch Engineering of Braintree, Massachusetts by GeoEngineers for geotechnical laboratory testing to obtain index properties. Analyses included grain-size with hydrometer testing to confirm United States Department of Agriculture (USDA) textural classification for Rawls Rate correlations to support preliminary stormwater management design. The samples were selected to represent potential receiving layers within areas of the Site that are anticipated to receive stormwater. Results of the laboratory analysis are provided in Attachment B.

SUBSURFACE CONDITIONS

In general, the soil conditions observed at the Site consist of surface treatments (asphalt) underlain by fill overlying natural granular soils.

The existing fill consists of fine to coarse sand with varying gravel and silt content. Various non-soil constituents, consistent with historic (urban) fill, such as brick, asphalt, glass, and ash particles were observed within the fill layer.

The natural soil deposit is a glacial outwash deposit, consisting of dense to very dense sand with varying amounts of coarse gravel and silt. Coarse gravel and frequent cobbles were persistent throughout the outwash deposit and resulted in frequent auger and direct push refusal between 7 and 25 feet bgs. Cobbles and/or boulders should be expected during excavation of the materials during construction.

Groundwater

Groundwater was observed to be between approximately 15 and 24 feet bgs in the existing wells installed by others, designated MW-1 through MW-3, as indicated in Figure 2. The depths to groundwater shown on Figure 2 are based on measurements by Vertex on December 18, 2021. Installation logs and records of these monitoring wells were not available to us at the time of this letter report.

Groundwater is anticipated to flow southwards, from Dudley Street towards Mill Brook to the south of the Site. It should be noted that groundwater levels will vary depending on seasonal variations in temperature and precipitation and can also be influenced by subsurface utilities, construction development and other factors.

ENVIRONMENTAL CONSIDERATIONS

Please refer to the environmental reports prepared by Vertex regarding any provisions for soil and/or groundwater management during demolition and construction.

GEOTECHNICAL ENGINEERING RECOMMENDATIONS

The paragraphs below provide our geotechnical recommendations for building foundations and site work.

STORMWATER MANAGEMENT DESIGN RECOMMENDATIONS

Based on the subsurface conditions observed in the test borings at the Site, we anticipate the subsurface conditions below the proposed stormwater management to be generally consistent with subsurface conditions encountered in borings GEO-3 and GEO-5, with the exception that there may be a thicker fill layer as the existing building currently resides over the future stormwater management area. We recommend that the future stormwater management area be constructed such that the existing fill material is removed and the natural sand be used as the receiving layer for stormwater infiltration.

Based on grain-size analysis results, we recommend the receiving layer soil be classified as sand and loamy sand based on the USDA soil classification system. These soils are classified by the Hydrologic Soil Group (HSG) A and correlate to Rawls Rates between 2.41 and 8.27 inches per hour. The laboratory results are in the table below. We recommend VHB select the appropriate design value based on the depth of the stormwater management area and their engineering judgement.

Boring ID	Sample Depth (ft)	USDA Classification	Rawls Rate (in/hr)
GEO-3W	5-12	Loamy Sand	2.41
GEO-5W	9-10.8	Loamy Sand	2.41
GEO-6W	5.3-6	Sand	8.27

Note:
Rawls Rates taken from Table 2.3.3 “1982 Rawls Rates” from the Massachusetts Stormwater Handbook Volume 3 Chapter 1.

Evidence of Estimated Seasonal High Groundwater (ESHGW) was not observed during drilling. Based on observations during test borings and measured groundwater data, it is our opinion that ESHGW for the site is greater than 10 feet below ground surface and is not located within 4 feet of the bottom of the proposed stormwater infiltration system.

GEOTECHNICAL DESIGN RECOMMENDATIONS

Below is a summary of the primary geotechnical considerations associated with design and redevelopment of the Site:

- The proposed buildings can be supported by conventional shallow, spread footings and a slab-on-grade.
- The spread footings should bear directly on natural, inorganic, granular soils or on compacted structural fill bearing directly on natural, inorganic, granular soils. Footings should not bear directly on fill material. As such, over-excavation and replacement of the existing fill material will be necessary as specified herein. Over-excavation could extend from approximately 2 to 8 feet below existing grade.
- The top two (2) feet of fill below the slab should be excavated and replaced and recompacted prior to placing base course. The fill that is present and extends more than 2 feet below finished grade may remain in place provided is compacted as specified herein.
- Fill material below future pavement areas may remain in place provided it is proof-compacted as specified herein. Existing foundations, slabs, concrete, asphalt, utilities, and any remnants of the existing development should be removed in their entirety below building areas.
- We anticipate the inorganic, granular, on-site fill can be re-used as backfill outside of building areas provided it is placed and compacted in accordance with project specifications.
- The proximity of the southern building footings to the existing slope have the potential to create slope instability. As such, regrading of that slope to a minimum 2H:1V slope angle should be incorporated into the design considerations. Alternatively, the foundations along the slope edge should be installed deeper than the minimum frost depth.

Foundation Design Criteria

We recommend that the building be supported on shallow spread footings bearing on natural soils or on structural fill placed directly over natural soils. Some over-excavation of the existing fill material will be necessary to expose the top of the natural soils suitable for footing bearing. Fill should be over-excavated from within the zone of influence (ZOI) of the footings to expose the top of the natural soil. The ZOI is defined as a one horizontal to one vertical (1H:1V) line projecting outward and downward from the outside edge of the foundation element.

Allowable Bearing Pressure

For foundations constructed as recommended in this memorandum, we recommend using a net allowable bearing pressure of 2 tons per square foot (TSF) for footings bearing on natural, granular soil, or compacted structural fill bearing on natural soil deposits. The allowable soil bearing pressure applies to the total of dead and long-term live loads.

Foundation Dimensions

The minimum recommended lateral dimension for isolated spread footings is 36 inches, while continuous wall footings should be at least 18 inches wide. Footings in areas exposed to freezing temperatures should be founded at least 4 feet below exterior finished grade for frost protection. Interior footings, in areas not exposed to freezing temperatures, should be at least 24 inches below finished floor grade, or depth that provides at least 12 inches between top of footing and finished floor elevation, whichever is deeper.

Please note that the depth of the footings adjacent to the existing slope may need to be extended deeper to limit the potential for slope instability. Further analysis of this requirement is needed pending final grading and final design of the footing dimensions based on the net allowable bearing capacity provided herein.

Settlement

Provided the footing subgrade is prepared as recommended herein, we estimate that the total post-construction settlement will be less than 1 inch. Differential settlements are estimated to be less than 0.5 inches between adjacent columns but will vary based on live load distribution and column spacing.

Slab on Grade Design Criteria

As stated herein, the top 2 feet of fill material should be excavated, replaced and recompacted prior to placing the base course material. The slab should consist of a soil supported slab-on-grade. The base course layer directly below the slab should consist of 6 inches of MassDOT Item M2.01.7 Dense-graded Crushed Stone. Provided the subgrade soils are prepared as recommended herein, the slab should be designed as a beam on an elastic foundation with modulus of subgrade reaction of 150 pounds per cubic inch (pci).

Existing Fill Material

Based on observations and soil classification, we anticipate that the existing granular fill may be suitable for reuse below pavement areas provided it can be placed and compacted as specified herein.

Slope Rehabilitation Considerations

Given the poor condition of the existing slope, we recommend that the south-facing slope along Mill Brook be re-graded to a minimum 2H:1V slope angle as part of reconstruction. Rehabilitated slopes should incorporate vegetative development and erosion control barriers to limit runoff and improve slope stability. Once structural column loads and footing sizes are available, we recommend that the slope stability be evaluated.

Earthwork Procedures for Preparation of Building Pad Areas

The following paragraphs describe the recommended earthwork procedures for preparation of the building areas.

- Foundations, utilities, existing concrete, topsoil and pavement, should be removed from the proposed building areas in their entirety.
- The existing fill material should be removed from the zone of influence (ZOI) of the footings in its entirety (to natural soil subgrade). For construction purposes, the ZOI is defined as the area within a line projecting outward and downward from the outside edge of the proposed footing at a 1H:1V (horizontal to vertical) slope. Fill material present in the buildings outside the ZOI may remain in place provided it is prepared as specified below.
- Fill below the proposed slab-on-grade should be excavated by 2 feet, replaced and recompacted as specified herein, provided the onsite fill meets the specifications herein for Structural Fill.
- The excavated site soil may be re-used as backfill provided it meets the requirements for Structural Fill provided herein. The fill should be placed in 12-inch-thick loose lifts and compacted to at least 95 percent of its maximum dry density (MDD) as determined by ASTM International (ASTM) D1557 Method C (modified proctor).

- After removing the existing fill as described above, the surface of the inorganic soils within the building footprint and 5 feet beyond the exterior walls should be proof compacted with at least six passes of a 10-ton vibratory roller (or equivalent effort) under the observation of a qualified geotechnical engineer, or his/her representative. Any soft or loose zones identified by proof compaction should be evaluated by excavation and replaced with compacted Structural Fill as specified herein.
- Temporary cut slopes for the over-excavation of fill material below proposed footings for building foundations should be conducted at a 2H:1V slope to maintain a safe excavation. The footing subgrade (at the bottom of the over-excavation) should be proof compacted, prior to the placement of raise-in-grade fill, with at least six passes of a 1,000-pound vibratory plate compactor.
- For the slab-on-grade, the subgrade should be proof-compacted with at least six passes of a 10,000-pound vibratory roller. Any soft or loose areas identified during proof-compaction should be over-excavated and replaced with Structural Fill as specified herein. The top 6 inches of fill directly below the slab should consist of base course material as specified herein. The fill should be placed in maximum 12-inch-thick loose lifts and compacted to at least 95 percent of its maximum dry density (MDD) as determined by ASTM International (ASTM) D1557 Method C (modified proctor).

Structural Fill

Fill placed to directly below and within the ZOI of foundations, within 5 feet of the bottom of slab elevation, within 5 feet of utilities (bottom and sides), and within 5 feet of finished grade for pavements and sidewalks should consist of Structural Fill as described below:

- Structural Fill used as base course for the building slab should meet the requirements of Dense-Graded Crushed Stone (1½-inch minus crushed stone) or Gravel Borrow – Type B, MASSDOT, Items M2.01.7-1 or M1.03.0 Type B, respectively.
- Structural fill placed as base course below pavements and sidewalks should meet the requirements of Dense-Graded Crushed Stone (1½-inch minus crushed stone - Type B, MASSDOT, Items M2.01.7-1), Gravel Borrow (M1.03.0 - Type B), or Reclaimed Pavement Borrow (M1.09.0-1) in pavement areas only. Reclaimed Pavement Borrow should not be placed within the building footprint.
- Structural Fill placed as backfill of over-excavation below footings and within the ZOI of footings, and as general raise-in-grade fill in non-building areas (below base course) should consist of the following:

Sieve Size	Percent Passing By Weight
4-inch	100
1-inch	70-100
No. 4	30-60
No. 200	0-15

- Structural fill placed within irregularly shaped utility trenches or trenches not accessible to compaction equipment should consist of Controlled Density Fill (CDF) consisting of high slump Portland cement concrete with a compressive strength less than 150 pci at 28 days, otherwise the trench should be backfilled in accordance with the project specifications.
- Structural fill placed to stabilize footing subgrades, if needed, and for the proposed infiltration gallery crushed stone layer should meet the requirements of Crushed Stone (¾-inch crushed gravel), MASSDOT, Item M2.01.4.

Crushed Stone should be compacted with at least six passes of a 1,000-pound vibratory plate compactor, or until visibly firm and stable, as determined by the Geotechnical Engineer, or his/her qualified representative.

Earthwork Procedures for Preparation of Pavement Areas

- In proposed pavement areas, the existing asphalt, topsoil, foundations, slabs, and site utilities should be removed in their entirety. Where existing, deep utilities (>6 feet bgs) are present in proposed parking areas, it is acceptable to completely fill the utility with flowable fill and abandon the utility in-place.
- The exposed subgrade for future parking areas should be proof-compacted with at least six passes of a 10 ton vibratory roller (or equivalent effort) under the observation of a qualified geotechnical engineer, or his/her representative is recommended. Any soft or loose areas identified by the proof-compaction should be removed in their entirety and replaced with Structural Fill as specified herein.
- General raise-in-grade fill in parking areas should consist of Structural Fill and placed and compacted as specified herein.
- Base course for pavement should placed in 12-inch-thick loose lifts and compacted to at least 95 percent of its maximum dry density (MDD) as determined by ASTM International (ASTM) D1557 Method C (modified proctor).

Recommended Pavement Design

Parking area and access drive pavement subgrades should be prepared as specified herein. If soft or loose soils are encountered, such unsuitable subgrade soils should be over-excavated in their entirety and replaced with Structural Fill as specified herein.

Asphalt Concrete Pavement for Parking Areas

The pavement design is intended to strike a balance between performance and cost in consideration of the soil available at the Site and anticipated traffic loads (passenger vehicles). We recommend the following (minimum) flexible pavement cross-sections for both standard and heavy-duty applications.

Layer	Standard Duty	Heavy Duty
	Thickness	
Asphalt Wearing Course (MassDOT Item M3.11.03)	1.5 inches	1.5 inches
Asphalt Binder Course (MassDOT Item M3.11.03)	1.5 inches	2.5 inches
Pavement Base Course (Reclaimed Pavement Borrow, MassDOT Item M1.09.0, or Dense-Graded Crushed Stone, MassDOT Item M2.01.7)	9 inches	9 inches

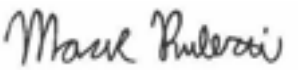
LIMITATIONS

We have prepared this preliminary design memorandum for the exclusive use of PSI Atlantic Arlington MA, LLC and their authorized agents for 34 Dudley Street in Arlington, Massachusetts.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this memorandum was prepared. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix C, "Design Memorandum Limitations and Guidelines for Use" for additional information pertaining to use of this memorandum.

Sincerely,
GeoEngineers, Inc.



Mark N. Ruberti, PE
Geotechnical Engineer (MA)



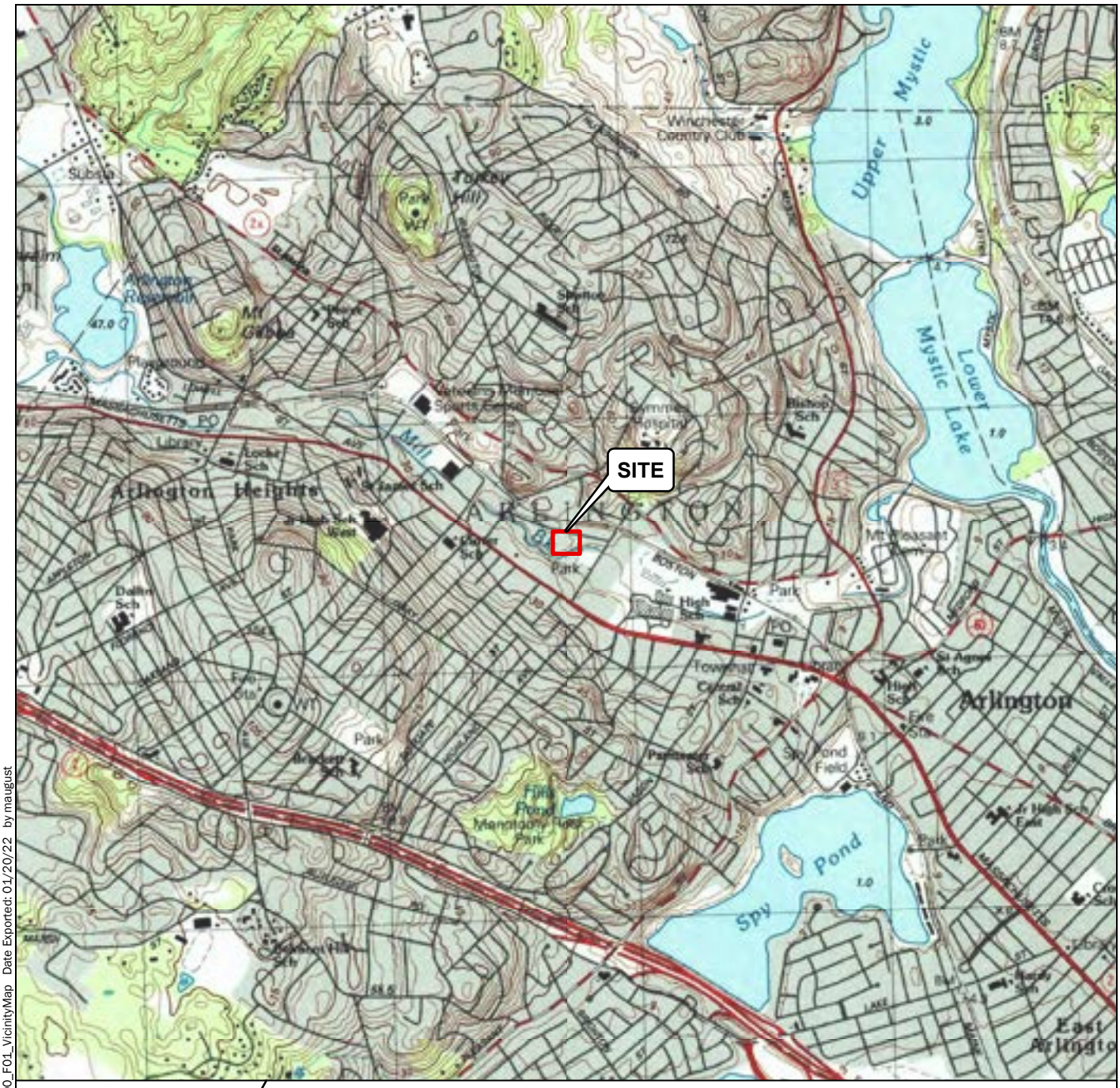
Stan S. Sadkowski, PE
Principal Geotechnical Engineer (MA)

MNR:SSS:kab

Attachments:
Figure 1. Site Locus Map
Figure 2. Exploration Location Plan
Appendices:
Appendix A. Boring Logs
  Figure A-1. Key to Exploration Logs
  Figures A-2 through A-7. Logs of Borings
Appendix B. Laboratory Testing Data Sheet
  Figure 21-S-B478 through 21-S-B480 - Particle Size Distribution Report
  Figure S-B478-B480 – USDA Soil Classification
Appendix C. Design Memorandum Limitations and Guidelines for Use

One copy submitted electronically

Disclaimer: Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by GeoEngineers, Inc. and will serve as the official document of record



N
W E
S

2,000 0 2,000
Feet

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI, USGS 24K Quadrangle Boston North, 1985.

Projection: NAD 1983 StatePlane Massachusetts Mainland FIPS 2001 Feet

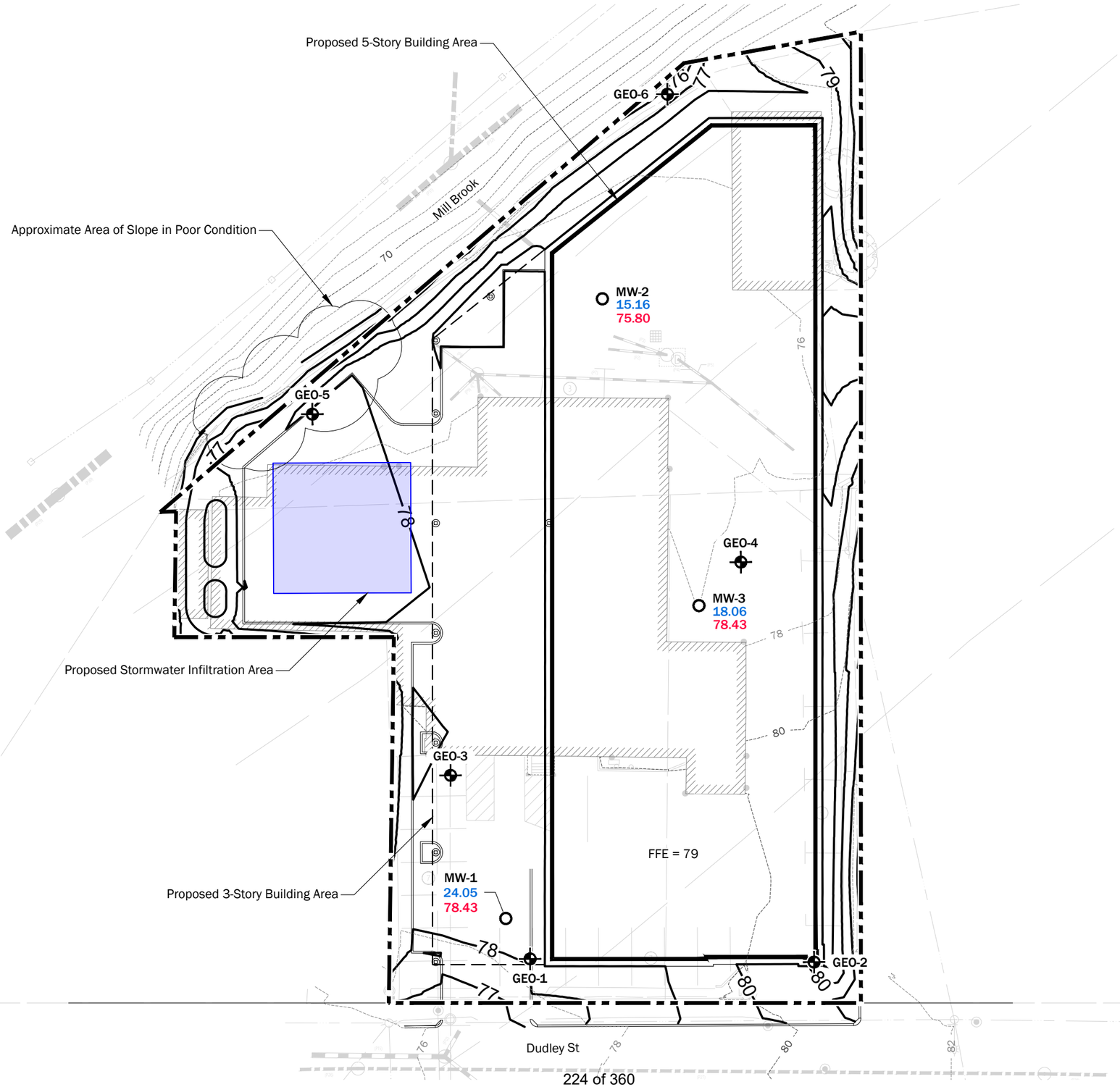
Site Locus Map

34 Dudley Street
Arlington, Massachusetts

GeoEngineers USA

Figure 1

P:\25\25754001\GIS\25754001_Project\25754001_Project.aprx\2575400100_F01_VicinityMap Date Exported: 01/20/22 by maugust



Legend

- Property Boundary
- Existing Building
- Proposed 5-Story Building Area
- Proposed 3-Story Building Area
- 80 — Proposed Grading
- Proposed Stormwater Infiltration Area
- GEO-1 — Boring by GeoEngineers, Inc., 2021 and 2022
- MW-1 — Monitoring Well by Others
  - 24.05 — Depth to Groundwater (Feet bgs) Based on Measurements Collected on December 18, 2021
  - 78.43 — Well Elevation (Feet)

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers USA, P.C. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers USA, P.C. and will serve as the official record of this communication.

Source(s): Background from VHB dated 10-28-2021.

Projection: MA State Plane, Mainland Zone, NAD83, US Foot

30 0 30
Feet

Exploration Location Plan

34 Dudley St
Arlington, Massachusetts

GeoEngineers USA

Figure 2

P:\25\25754001\CAD\00\SW and GT Design Memo\25754001100_F02_Exploration Location Plan.dwg TAB:F02 Date Exported: 01/28/22 - 9:45 by gregister

APPENDIX A
Boring Logs

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point lead test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
UU	Unconsolidated undrained triaxial compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

Drilled	Start 1/8/2022	End 1/8/2022	Total Depth (ft)	12	Logged By / Checked By	PS/MR	Driller	G&M Subsurface	Drilling Method	Direct Push
Surface Elevation (ft) / Vertical Datum	78.5 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	GeoProbe 7822DT		
Easting (X) / Northing (Y)			System Datum				Groundwater not observed at time of exploration			

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name / Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
75	0	4	11		1		AC	Approximately 3 inches asphalt concrete pavement			
							SM	Dark brown-black fine to coarse sand, some gravel, little silt, very few ash particles (medium dense, moist) (fill)			
	5	6	19		2		SP	Brown-gray fine to coarse sand, some gravel, trace silt (medium dense, moist) (fill)			
70							SP	Brown-gray fine to coarse sand, some gravel, trace silt (very dense, moist)			Fill break determined by observations of direct push sleeve
	10	12	64		3						

Boring terminated at approximately 12 feet below ground surface due to direct push refusal

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Log of Boring GEO-1

GeoEngineers USA

Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-2
Sheet 1 of 1

Date:1/28/22 Path:P:\25\25754001\GINT\25754001GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Drilled Start 12/18/2021 End 12/18/2021	Total Depth (ft) 12.75	Logged By SR/MR Checked By	Driller Crawford Drilling Service	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 80.5 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment B52 Turck Rig	
Easting (X) Northing (Y)		System Datum		Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
80	0	10	36		1		AC	Approximately 3 inches asphalt concrete pavement			
							SM	Dark brown fine to coarse sand with some gravel, little silt (dense, moist) (fill)			
75	5	13	34		2		SP	Brown fine to coarse sand with some gravel, trace silt (dense, moist)			
70	10	11	72		3		SM	Brown fine to coarse sand with some gravel, little silt (very dense, moist)			
								Boring terminated at approximately 12.8 feet below ground surface due to auger refusal			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Log of Boring GEO-2

GeoEngineers USA

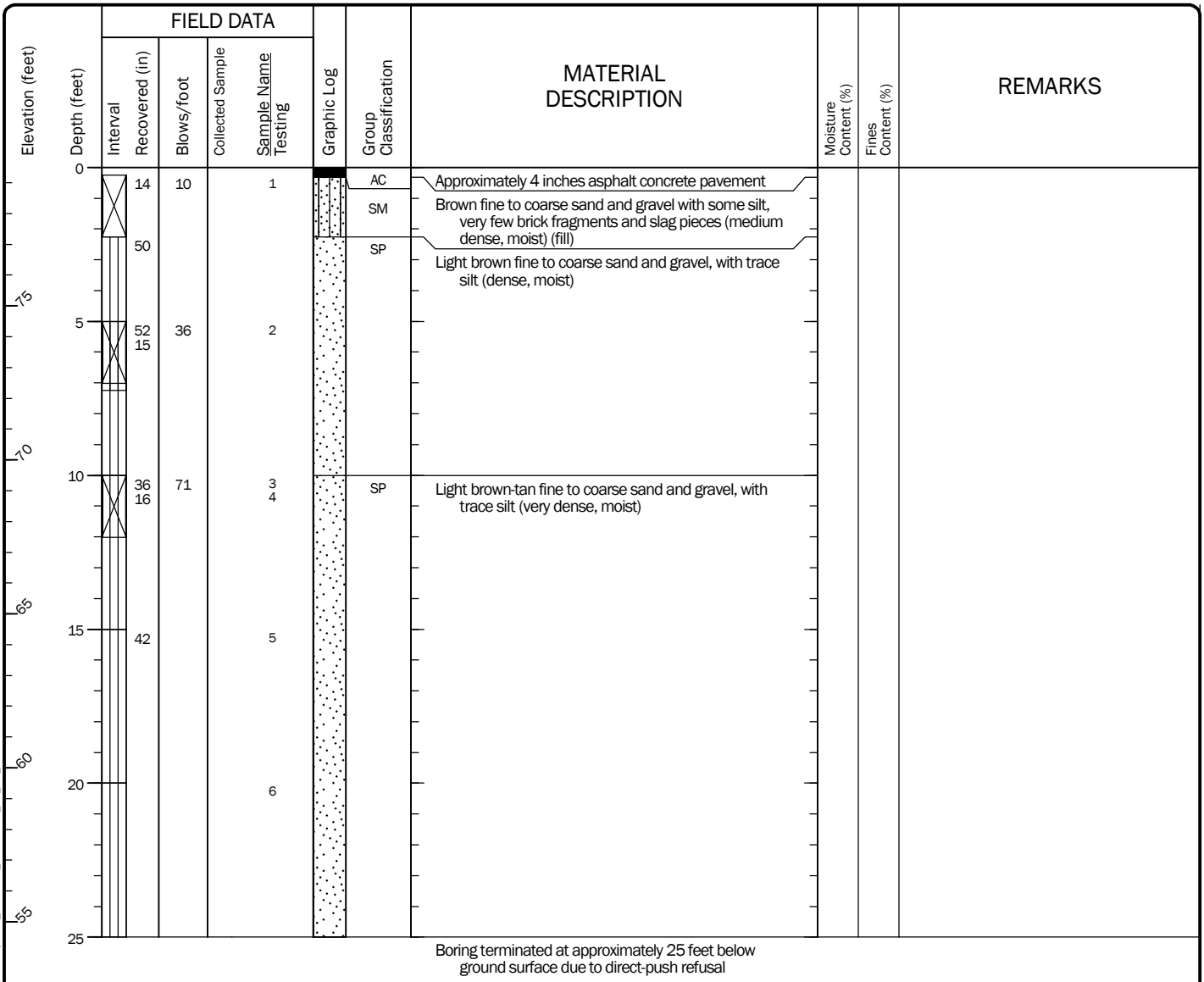
Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-3
Sheet 1 of 1

Date:1/28/22 Path:P:\25\25754001\GINT\25754001GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Drilled	Start 12/9/2021	End 12/9/2021	Total Depth (ft)	25	Logged By / Checked By	VT	Driller	G&M Subsurface	Drilling Method	Direct Push
Surface Elevation (ft) / Vertical Datum	79.5 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop			Drilling Equipment	GeoProbe 7822DT		
Easting (X) / Northing (Y)			System Datum				Groundwater not observed at time of exploration			

Notes:



Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Date:1/28/22 Path:P:\25\25754001\GINT\25754001100.GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Log of Boring GEO-3

GeoEngineers USA

Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-4
Sheet 1 of 1

Drilled	Start 1/8/2022	End 1/8/2022	Total Depth (ft) 7	Logged By PS/MR Checked By	Driller G&M Subsurface	Drilling Method Direct Push
Surface Elevation (ft) Vertical Datum	76 NAVD88		Hammer Data	Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment	GeoProbe 7822DT
Easting (X) Northing (Y)			System Datum		Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
75	0	12	32		1		AC	Approximately 5 inches asphalt concrete pavement			Boring terminated at approximately 2.2 ft below ground surface due to direct push refusal; offset approximately 5 ft to the east and resumed advancing exploration
							SP	Brown-gray fine to coarse sand, some gravel, trace silt (dense, moist) (fill)			
70	5	15	80		2		SP	Brown-gray fine to coarse sand, some gravel, trace silt (very dense, moist)			
								Boring terminated at approximately 7 feet below ground surface due to direct push refusal			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Date:1/28/22 Path:P:\25\25754001\GINT\25754001GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEIB_GEOTECH_STANDARD_%F_NO_GW

Log of Boring GEO-4

GeoEngineers USA

Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-5
Sheet 1 of 1

Drilled Start 12/18/2021 End 12/18/2021	Total Depth (ft) 16.25	Logged By SR/MR Checked By	Driller Crawford Drilling Service	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 75.5 Vertical Datum NAVD88	Hammer Data Autohammer 140 (lbs) / 30 (in) Drop	Drilling Equipment B52 Turck Rig			
Easting (X) Northing (Y)	System Datum	Groundwater not observed at time of exploration			
Notes:					

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
75	0	12	12		1		AC	Approximately 3 inches asphalt concrete pavement			
							SM	Dark brown fine to coarse sand with some gravel, little silt, very few asphalt pieces, very few glass particles (medium dense, moist) (fill)			
70	5	6	9		2		SP	Brown fine to coarse sand with some gravel, trace silt, very few asphalt pieces (loose, moist) (fill)			
65	10	10	71		3		GP	Gray gravel with some sand, trace silt (very dense, moist)			
60	15	0	50/5"		4		NR	No recovery (very dense)			
		4	50/4"		5		SP	Gray fine to coarse sand and gravel, with trace silt (very dense, moist)			
								Boring terminated at approximately 16.3 feet below ground surface due to auger refusal			

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Log of Boring GEO-5

GeoEngineers USA

Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-6
Sheet 1 of 1

Date:1/28/22 Path:P:\25\25754001\GINT\25754001GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Drilled Start 12/18/2021 End 12/18/2021	Total Depth (ft) 10.5	Logged By SR/MR Checked By	Driller Crawford Drilling Service	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 74.5 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment B52 Turck Rig	
Easting (X) Northing (Y)		System Datum		Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0	8	36		1		AC	Approximately 3 inches asphalt concrete pavement			
							SM	Dark brown fine to coarse sand with some gravel, little silt, few wood pieces, very few brick particles (dense, moist) (fill)			
70	5	12	42		2		SM	Dark brown fine to coarse sand with little gravel and little silt (dense, moist) (fill)			Boring terminated at approximately 4 feet below ground surface due to auger refusal; offset approximately 10 feet northwest and continued advancing exploration
							SP	Brown fine to coarse sand with some gravel, trace silt (dense, moist)			
65	10	11	88/11"		3						

Boring terminated at approximately 10.5 feet below ground surface due to auger refusal

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on (undetermined). Vertical approximated based on Google Earth.

Date:1/28/22 Path:P:\25\25754001\GINT\25754001GPJ DBLibrary/Library:GEOUSA_DF_STD_US.GLB/GEI8_GEOTECH_STANDARD_%F_NO_GW

Log of Boring GEO-6

GeoEngineers USA

Project: 34 Dudley Street
Project Location: Arlington, Massachussetts
Project Number: 25754-001-00

Figure A-7
Sheet 1 of 1

APPENDIX B
Laboratory Testing Data Sheet

THIELSCH ENGINEERING

195 Frances Avenue
Cranston RI, 02910
Phone: (401)-467-6454
Fax: (401)-467-2398
thielsch.com
Let's Build a Solid Foundation

Client Information:
GeoEngineers, Inc.
239 Causeway Street, Boston, MA 02114
PM: Mark Ruberti
Assigned By: Mark Ruberti
Collected By: Client

Project Information:
34 Dudley Street
Arlington, MA
GeoEngineers Project Number: 25754-001-00
Summary Page: 1 of 1
Report Date: 01.03.2022

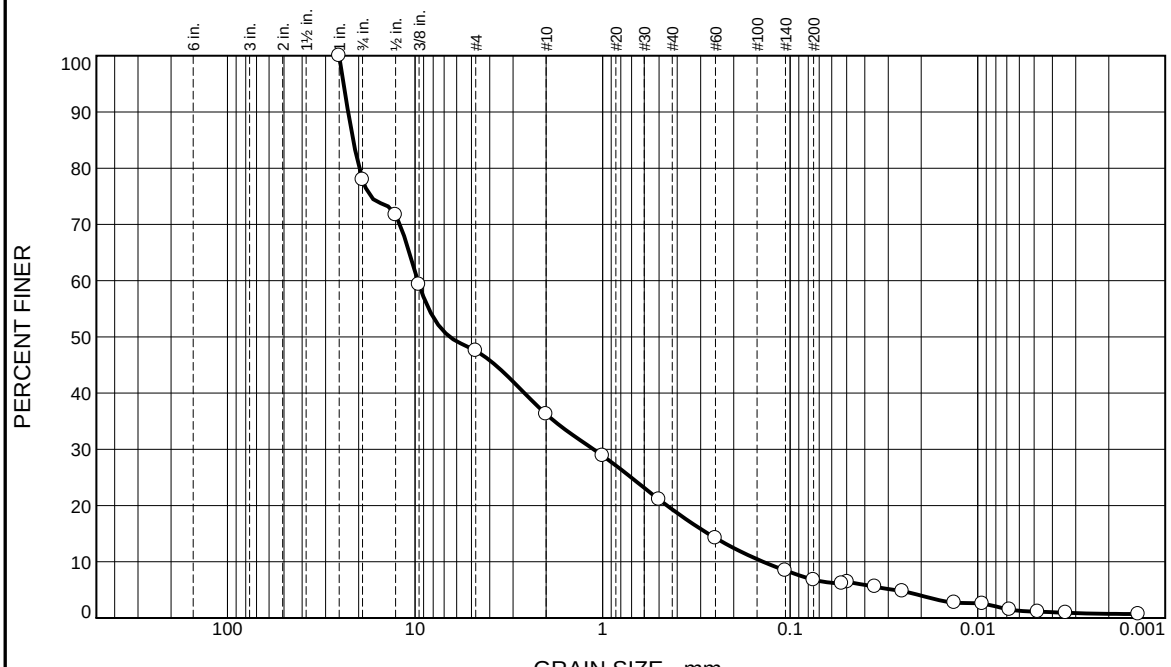
LABORATORY TESTING DATA SHEET, Report No.: 7421-M-B010

Material Source	Sample No.	Depth (Ft)	Laboratory No.	Identification Tests								Proctor / CBR / Permeability Tests								Laboratory Log and Soil Description
				As Received Water Content %	LL %	PL %	Gravel %	Sand %	Fines %	Org. %	G_s	Dry unit wt. pcf	Test Water Content %	γ_d MAX (pcf) / W_{opt} (%)	γ_d MAX (pcf) / W_{opt} (%) (Corr.)	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	
				D2216	D4318		D6913			D2974	D854			D1557						
Boring	GEO-3 (S2 & S3)	5-12	21-S-B478				63.7	30.1	6.2											Light Brown loamy sand
Boring	GEO-5 (S1)	9-10.8	21-S-B479				68.3	23.9	7.8											Grey loamy sand
Boring	GEO-6 (S-1B)	5.3-6	21-S-B480				53.0	40.8	6.2											Light Brown sand

Date Received: ***12.21.21*** Reviewed By: Date Reviewed: ***01.03.22***

This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made.
This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	22.1	30.4	11.2	7.4	7.8	6.9	6.1	1.9	2.2	3.3	0.7

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	77.9		
1/2"	71.7		
3/8"	59.3		
#4	47.5		
#10	36.3		
#18	28.9		
#35	21.1		
#60	14.2		
#140	8.4		
#200	6.8		
#270	6.2		
0.0494 mm.	6.4		
0.0353 mm.	5.6		
0.0252 mm.	4.8		
0.0133 mm.	2.7		
0.0094 mm.	2.5		
0.0068 mm.	1.5		
0.0048 mm.	1.1		
0.0034 mm.	0.9		
0.0014 mm.	0.7		

* (no specification provided)

Material Description

Light Brown loamy sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= GP-GM **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 22.7414 D_{85}= 21.3790 D_{60}= 9.6783
D_{50}= 6.5171 D_{30}= 1.1164 D_{15}= 0.2733
D_{10}= 0.1393 C_u= 69.50 C_c= 0.92

Remarks

Date Received: 12/21/21 **Date Tested:** 12/28/21

Tested By: DN / CC

Checked By: Christina Colman

Title: Laboratory Supervisor

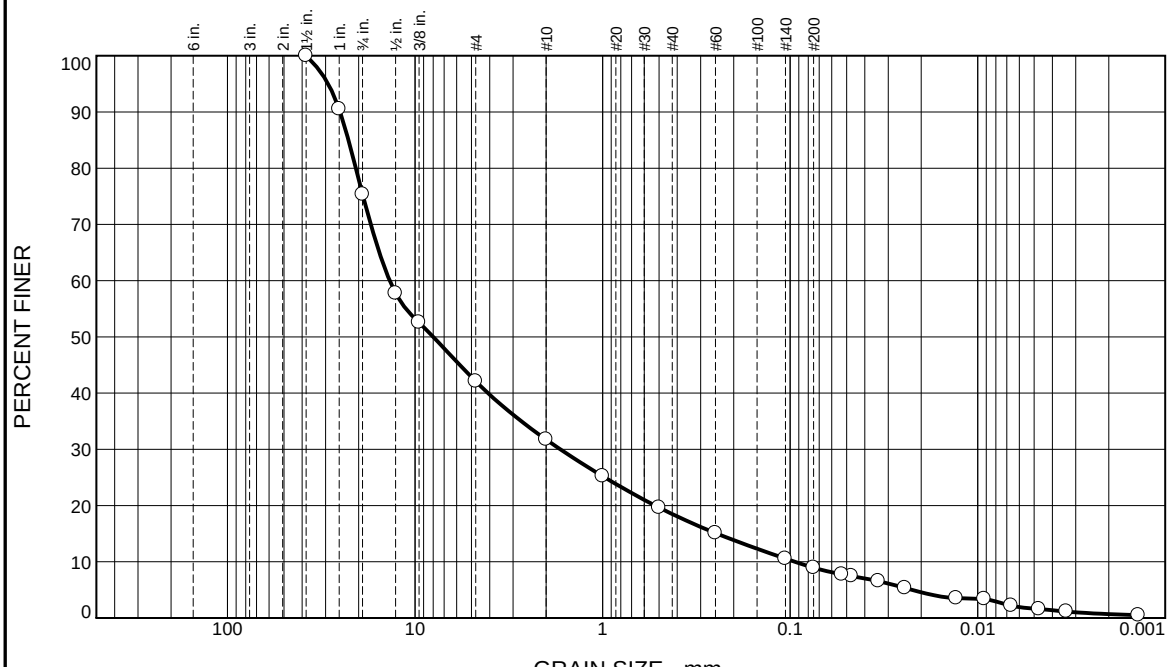
Source of Sample: Boring **Depth:** 5-12' **Date Sampled:**
Sample Number: GEO-3 (S2 & S3)

Thielsch Engineering Inc.

Cranston, RI

Client: GeoEngineers, Inc.
Project: 34 Dudley Street
Arlington, MA
Project No: 25754-001-00 **Figure** 21-S-B478

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	24.6	33.3	10.4	6.5	5.6	4.5	4.8	2.5	3.2	3.9	0.7

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1 1/2"	100.0		
1"	90.5		
3/4"	75.4		
1/2"	57.8		
3/8"	52.6		
#4	42.1		
#10	31.7		
#18	25.2		
#35	19.6		
#60	15.1		
#140	10.6		
#200	8.9		
#270	7.8		
0.0471 mm.	7.5		
0.0338 mm.	6.6		
0.0244 mm.	5.3		
0.0130 mm.	3.5		
0.0092 mm.	3.4		
0.0066 mm.	2.2		
0.0047 mm.	1.6		
0.0034 mm.	1.1		
0.0014 mm.	0.5		

* (no specification provided)

Material Description

Grey loamy sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** **PI=**

Classification

USCS (D 2487)= **AASHTO (M 145)=**

Coefficients

D_{90}= 25.0933 D_{85}= 22.6442 D_{60}= 13.6565
D_{50}= 7.9942 D_{30}= 1.6791 D_{15}= 0.2453
D_{10}= 0.0945 C_u= 144.54 C_c= 2.18

Remarks

Date Received: 12/21/21 **Date Tested:** 12/28/21

Tested By: DN / CC

Checked By: Christina Colman

Title: Laboratory Supervisor

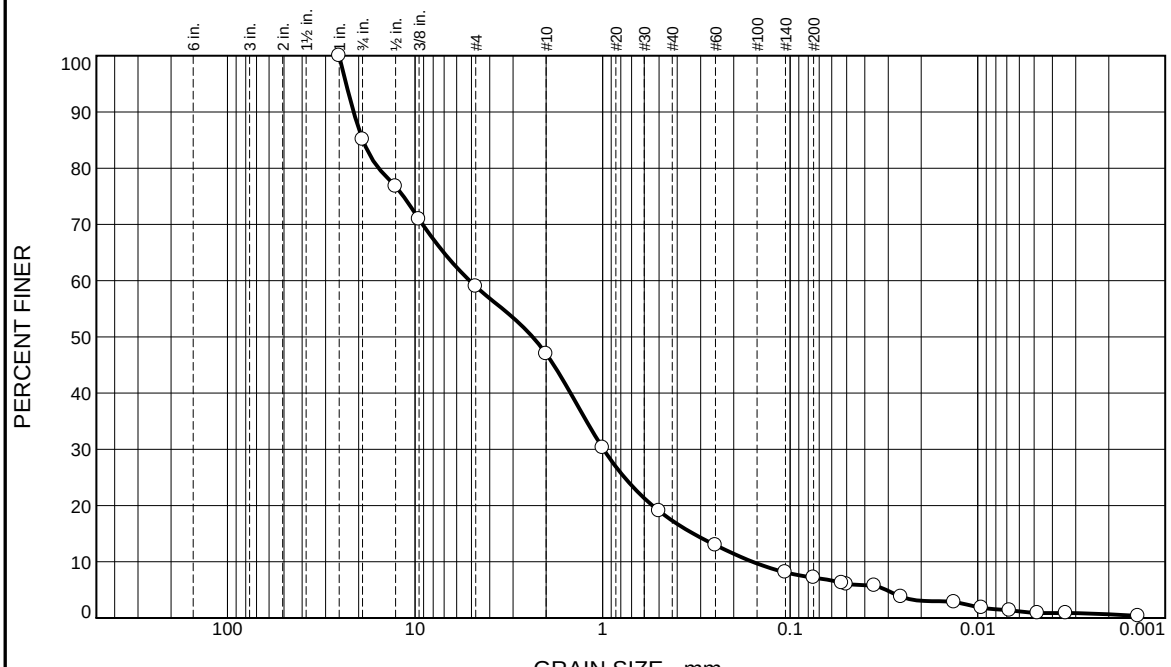
Source of Sample: Boring **Depth:** 9-10.8' **Date Sampled:**
Sample Number: GEO-5 (S1)

Thielsch Engineering Inc.

Cranston, RI

Client: GeoEngineers, Inc.
Project: 34 Dudley Street
Arlington, MA
Project No: 25754-001-00 **Figure** 21-S-B479

Particle Size Distribution Report



% Stones	% +3"	% Gravel			% Sand					% Silt		% Clay
		Coarse	Medium	Fine	V. Crs.	Crs.	Med.	Fine	V. Fine	Crs.	Fine	
0.0	0.0	14.9	26.1	12.0	16.7	11.3	6.0	5.1	1.7	3.1	2.4	0.7

Test Results (D6913 & ASTM D 1140)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
1"	100.0		
3/4"	85.1		
1/2"	76.8		
3/8"	70.9		
#4	59.0		
#10	47.0		
#18	30.3		
#35	19.0		
#60	13.0		
#140	8.1		
#200	7.2		
#270	6.2		
0.0502 mm.	6.0		
0.0356 mm.	5.8		
0.0256 mm.	3.8		
0.0134 mm.	2.8		
0.0095 mm.	1.8		
0.0068 mm.	1.4		
0.0048 mm.	0.9		
0.0034 mm.	0.9		
0.0014 mm.	0.4		

* (no specification provided)

Material Description

Light Brown sand

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SW-SM **AASHTO (M 145)=** A-1-a

Coefficients

D_{90}= 21.2538 D_{85}= 18.9911 D_{60}= 5.1201
D_{50}= 2.3620 D_{30}= 0.9875 D_{15}= 0.3280
D_{10}= 0.1585 C_u= 32.31 C_c= 1.20

Remarks

Date Received: 12/21/21 **Date Tested:** 12/28/21

Tested By: DN / CC

Checked By: Christina Colman

Title: Laboratory Supervisor

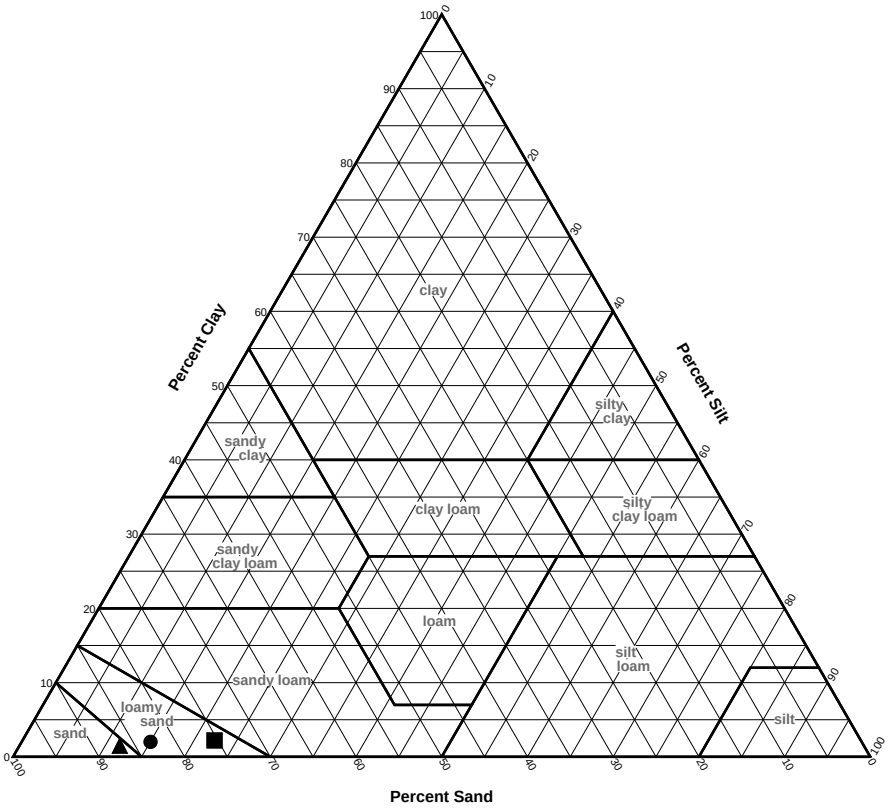
Source of Sample: Boring **Depth:** 5.3-6' **Date Sampled:**
Sample Number: GEO-6 (S-1B)

Thielsch Engineering Inc.

Cranston, RI

Client: GeoEngineers, Inc.
Project: 34 Dudley Street
Arlington, MA
Project No: 25754-001-00 **Figure** 21-S-B480

USDA Soil Classification



SOIL DATA							
	Source	Sample No.	Depth	Percentages From Material Passing a #10 Sieve			Classification
				Sand	Silt	Clay	
●	Boring	GEO-3 (S2 & S3)	5-12'	82.9	15.2	1.9	Loamy sand
■	Boring	GEO-5 (S1)	9-10.8'	75.4	22.4	2.2	Loamy sand
▲	Boring	GEO-6 (S-1B)	5.3-6'	86.8	11.7	1.5	Sand

Thielsch Engineering Inc.

Cranston, RI

Client: GeoEngineers, Inc.

Project: 34 Dudley Street
Arlington, MA

Project No.: 25754-001-00

Figure S-B478-B480

APPENDIX C
Design Memorandum Limitations and Guidelines for Use

APPENDIX C
DESIGN MEMORANDUM LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this memorandum.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its memorandums. Please confer with GeoEngineers if you need to know more how these "Stormwater Evaluation Memorandum Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This memorandum has been prepared for PSI Atlantic Arlington MA, LLC and for the Project(s) specifically identified in the memorandum. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this memorandum is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with PSI Atlantic Arlington MA, LLC dated December 29, 2021 and generally accepted geotechnical practices in this area at the time this memorandum was prepared. We do not authorize, and will not be responsible for, the use of this memorandum for any purposes or projects other than those identified in the memorandum.

A Geotechnical and Stormwater Evaluation Memorandum is based on a Unique Set of Project-Specific Factors

This memorandum has been prepared for schematic design for the proposed development concept located at 34 Dudley Street in Arlington, Massachusetts. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and memorandum. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this memorandum if it was:

- Not prepared for you,
- Not prepared for your project,
- Not prepared for the specific site explored, or
- Completed before important project changes were made.

For example, changes that can affect the applicability of this memorandum include those that affect:

- The function of the proposed structure;
- Elevation, configuration, location, orientation or weight of the proposed structure;

[1] Developed based on material provided by GBA, GeoProfessional Business Association; www.geoprofessional.org.

- Composition of the design team; or
- Project ownership.

If changes occur after the date of this memorandum, GeoEngineers cannot be responsible for any consequences of such changes in relation to this memorandum unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Subsurface Conditions Can Change

This stormwater evaluation memorandum is based on conditions that existed at the time the study was performed. The findings and conclusions of this memorandum may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the memorandum date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our memorandum or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this memorandum for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this memorandum. Our memorandum, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Stormwater Evaluation Memorandum Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this memorandum are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this memorandum if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Stormwater Evaluation Memorandum Could Be Subject to Misinterpretation

Misinterpretation of this memorandum by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the memorandum, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering memorandum should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the memorandum can create a risk of misinterpretation.

Give Contractors a Complete Memorandum and Guidance

Some owners and design professionals believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering memorandum, but preface it with a clearly written letter of transmittal. In that letter, advise contractors that the memorandum was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with GeoEngineers and/or to conduct additional study to obtain the specific types of information they need or prefer. A pre-bid conference can also be valuable. Be sure contractors have sufficient time to perform additional study. Only then might an owner be in a position to give contractors the best information available, while requiring them to at least share the financial responsibilities stemming from unanticipated conditions. Further, a contingency for unanticipated conditions should be included in your project budget and schedule.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Geotechnical, Geologic and Environmental Memoranda Should Not Be Interchanged

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic memorandum does not usually relate any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental memoranda are not used to address geotechnical or geologic concerns regarding a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this memorandum does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.



Map Scale: 1:2,570 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 21, Sep 2, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2020—Sep 15, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
602	Urban land	3.9	28.6%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	3.5	26.1%
655	Udorthents, wet substratum	6.1	45.3%
Totals for Area of Interest		**13.6**	**100.0%**

Required and Provided Recharge Volumes

Recharge Calculations

Project	Arlington Self Storage	**Project #**	52816.00
Calculated by	SJH	**Date**	2/3/2022
Checked by	EKG	**Date**	2/7/2022

REQUIRED RECHARGE VOLUME

Hydrologic Soil Group (HSG)	Area (ft^2)	Inches of Runoff (in)	Volume (ft^3)
A	26,001	0.60	1,300
B	0	0.35	0
C	0	0.25	0
D	0	0.10	0
TOTAL			**1,300**

CAPTURE AREA ADJUSTMENT

Required Recharge Volume (ft^3)	1,300
Total Site Net Impervious Area (ft^2)	26,001
Total Site Impervious Area Draining to Recharge Facilities (ft^2)	25,700
Capture Area Adjustment Factor	1.01
Adjusted Required Recharge Volume (ft^3)	**1,315**

PROVIDED RECHARGE VOLUME

SUBSURFACE INFILTRATION SYSTEM #1:

MC-4500

Volumes provided below the lowest outlet at elevation: 71.7

Provided Volume:	Bottom Area (ft^2)	Volume (ft^3)
	1,112	**1,954**

Drawdown: $(V_{Infiltration}/A_{Bottom})$/Rawl's Rate

Rawls Recharge Rate:	2.4	(in/hr)
Drawdown Time:	8.75	(hours)

RECHARGE VOLUME SUMMARY

Required Recharge Volume:	**1,300**	(ft^3)
Total Recharge Volume Provided:	**1,954**	(ft^3)

Appendix D: Standard 4 Computations and Supporting Information

- Operation and Maintenance Plan
- Water Quality Volume Calculations
- TSS Removal Worksheets

Operations and Maintenance Plan

Proposed Self-Storage Facility

34 Dudley Street
Arlington, Massachusetts

PREPARED FOR

PSI Atlantic Arlington MA, LLC
530 Oak Court Drive, Suite 155
Memphis, TN 38117

PREPARED BY

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

February 2022

Table of Contents

Project Informtion ..... **iii**

Section A: Source Control **A-1**

Section B: Spill Prevention **B-1**

B.1 Initial Notification B-1
B.2 Further Notification B-1
B.3 Assessment – Initial Containment B-4

Section C: Snow Management **C-1**

Section D: Maintenance of Stormwater Management Systems **D-1**

D.1 Pavement Systems D-1
D.1.1 Standard Asphalt Pavement D-1
D.1.2 Permeable Asphalt Pavement D-1
D.1.3 Permeable Pavers D-1
D.2 Structural Stormwater Management Devices D-1
D.2.1 Catch Basins D-1
D.2.2 Structural Water Quality Devices D-2
D.2.3 Subsurface Infiltration Basins D-2
D.2.4 Stormwater Outfalls D-3
D.2.5 Roof Drain Leader D-3
D.3 Vegetated Stormwater Management Devices D-3
D.3.1 Rain Gardens / Bioretention Basins D-3
D.3.2 Biofiltration Swales D-5
D.3.3 Surface Infiltration/Detention Basins D-5
D.3.4 Vegetated Areas Maintenance D-5

Section E: Operations and Maintenanc Plan Summary **E-1**

E.1 Routine Maintenance Checklists E-1
E.2 Reporting and Documentation E-1
E.3 Construction Practices Maintenance/ Evaluation Checklist E-2
E.4 Long-term Maintenance/Evaluation Checklist E-3
E.5 Maintenance Checklists and Device Location Maps E-4

Section F: Product Literature **F-13**

This page intentionally left blank.

Project Informtion

Site

Proposed Self-Storage Facility
34 Dudley Street
Arlington, Massachusetts, 02476

Developer

PSI Atlantic Arlington MA, LLC.
530 Oak Court Drive, Suite 155
Memphis, TN 38117
Phone Number: _____

Site Supervisor

Site Manager Name_____
Site Manager Address_____
Site Manager City, State Zip_____
Site Manager Phone Number_____

Site Contact

Name: _____

Telephone: _____

Cell phone: _____

Email: _____

This page intentionally left blank.

Section A: Source Control

This page intentionally left blank.

A Source Control

A comprehensive source control program will be implemented at the Proposed Self-Storage Facility, which includes the following components:

- Regular pavement sweeping on the asphalt surfaces
- Catch basin cleaning
- Clearing litter from the parking area, islands, and perimeter landscape areas
- Enclosure and regular maintenance of all dumpsters
- Spill Prevention training

This page intentionally left blank.

Section B: Spill Prevention

This page intentionally left blank.

B Spill Prevention

Spill prevention equipment and training will be provided by the Owner or property management company.

B.1 Initial Notification

In the event of a spill the facility and/or construction manager or supervisor will be notified immediately.

Facility Manager (name): _____

Facility Manager (phone): _____

Construction Manager (name) : _____

Construction Manager (phone): _____

The supervisor will first contact the Fire Department and then notify the Police Department, the Public Health Commission and the Conservation Commission. The Fire Department is ultimately responsible for matters of public health and safety and should be notified immediately.

B.2 Further Notification

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachussets Department of Environmental Protection (DEP) and the EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the main construction/facility office and readily accessible to all employees. A hazardous waste spill report shall be completed as necessary using the attached form.

Emergency Notification Phone Numbers

1.	**FACILITY MANAGER**		
	Name:	Phone:	
		Beeper/Cell:	
		Home Phone:	
	Alternate Contact:	Phone:	
		Beeper/Cell:	
		Home Phone:	
2.	**FIRE & POLICE DEPARTMENT**	Emergency:	911
3.	**CLEANUP CONTRACTOR**		
	Address:	Phone:	
4.	**STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)**	Emergency:	978-694-3200
5.	**NATIONAL RESPONSE CENTER**	Phone:	(800) 424-8802
	Alternate: U.S. Environmental Protection Agency	Emergency:	
		Business:	
6.	**MUNICIPAL HEALTH DEPARTMENT**	Phone:	(781) 316-3170
	Municipal Conservation Commission:	Phone:	(781) 316-3090

Hazardous Waste & Oil Spill Report

Date: _____ **Time:** _____ **AM / PM**

Exact location (Transformer #): _____

Type of equipment: _____ **Make:** _____ **Size:** _____

S / N: _____ **Weather Conditions:** _____

On or near water? ☐ Yes ☐ No **If yes, name of body of water:** _____

Type of chemical / oil spilled: _____

Amount of chemical / oil spilled: _____

Cause of spill: _____

Measures taken to contain or clean up spill: _____

Amount of chemical / oil recovered: _____ **Method:** _____

Material collected as a result of cleanup:

_____ drums containing _____

_____ drums containing _____

_____ drums containing _____

Location and method of debris disposal: _____

Name and address of any person, firm, or corporation suffering charges: _____

Procedures, method, and precautions instituted to prevent a similar occurrence from recurring: _____

Spill reported by General Office by: _____ **Time:** _____ **AM / PM**

Spill reported to DEP / National Response Center by: _____

DEP Date: _____ **Time:** _____ **AM / PM** **Inspector:** _____

NRC Date: _____ **Time:** _____ **AM / PM** **Inspector:** _____

Additional comments: _____

B.3 Assessment – Initial Containment

The supervisor or manager will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. A list of recommended spill equipment to be kept on site is included on the following page.

Fire / Police Department: 911

Municipality Health Department (781) 316-3170

Municipality Conservation Commission: (781) 316-3090

Emergency Response Equipment

The following equipment and materials shall be maintained at all times and stored in a secure area for long-term emergency response need.

Supplies	Quantity	Recommended Suppliers
› Sorbent Pillows/"Pigs"	2	http://www.newpig.com Item # KIT276 — mobile container with two pigs
› Sorbent Boom/Sock	25 feet	http://www.forestry-suppliers.com
› Sorbent Pads	50	
› Lite-Dri® Absorbent	5 pounds	
› Shovel	1	Item # 33934 — Shovel (or equivalent)
› Pry Bar	1	Item # 43210 — Manhole cover pick (or equivalent)
› Goggles	1 pair	Item # 23334 — Goggles (or equivalent)
› Gloves – Heavy	1 pair	Item # 90926 — Gloves (or equivalent)

Section C: Snow Management

This page intentionally left blank.

C Snow Management

Snow storage areas are shown on the attached Map.

- Snow storage areas will be managed to prevent blockage of storm drain catch basins and stormwater drainage swales. Snow combined with sand and debris may block a storm drainage system, diminishing the infiltration capacity of the system and causing localized flooding.
- Sand and debris deposited on vegetated or paved areas shall be cleared from the site and properly disposed of at the end of the snow season, no later than May 15.
- Snow shall not be dumped into any waterbody, pond, or wetland resource area.

This page intentionally left blank.

Section D: Maintenance of Stormwater Management Systems

This page intentionally left blank.

D Maintenance of Stormwater Management Systems

D.1 Pavement Systems

D.1.1 Standard Asphalt Pavement

- Sweep or vacuum standard asphalt pavement areas at least four times per year with a rotary brush sweeper or vacuum sweeper and properly dispose of removed material.
- Recommended sweeping schedule:
- Oct/Nov
- Feb/Mar
- Apr/May
- Aug/Sep
- More frequent sweeping of paved surfaces will result in less accumulation in catch basins, less cleaning of subsurface structures, and less disposal costs.
- Check loading docks and dumpster areas frequently for spillage and/or pavement staining and clean as necessary.

D.2 Structural Stormwater Management Devices

D.2.1 Catch Basins and Area Drains

The proper removal of sediments and associated pollutants and trash occurs only when catch basin inlets and sumps are cleaned out regularly. The more frequent the cleaning, the less likely sediments will be re-suspended and subsequently discharged. In addition, frequent cleaning also results in more volume available for future deposition and enhances the overall performance. As noted in the pavement Operation and Maintenance (O&M) section, more frequent sweeping of paved surfaces will result in less accumulation in catch basins, less cleaning of subsurface structures, and less disposal costs.

There is one (1) catch basin and two (2) area drains at the Self-Storage Facility. These catch basins are constructed with sumps (minimum 4 feet) and hooded outlets to trap debris,

sediments, and floating contaminants. Disposal of all sediments must be in accordance with applicable local, state, and federal guidelines. A map of the catch basin locations is included in Section E.5 Maintenance Checklists and Device Location Maps.

Inspections and Cleaning

- All catch basins shall be inspected at least four times per year and cleaned a minimum of at least once per year.
- Sediment (if more than six inches deep) and/or floatable pollutants shall be pumped from the basin and disposed of at an approved offsite facility in accordance with all applicable regulations.
- Any structural damage or other indication of malfunction will be reported to the site manager and repaired as necessary
- During colder periods, the catch basin grates must be kept free of snow and ice.
- During warmer periods, the catch basin grates must be kept free of leaves, litter, sand, and debris.

D.2.2 Subsurface Infiltration Basins

The subsurface infiltration/detention basins are used to detain and infiltrate roadway and rooftop runoff. There is one (1) subsurface infiltration basin at the Self-Storage Facility. Each of these basins has a water quality pre-treatment device in the form of a subsurface sediment removal row to protect the infiltration bed from clogging. The sediment removal row is an integral part of the underground infiltration system and is comprised of a perforated pipe, wrapped in a filter fabric and surrounded with gravel. To maintain pre-treatment functionality, this sediment removal row requires regular inspection and cleaning. A map of the infiltration basin locations is included in Section E.5 Maintenance Checklists and Device Location Maps.

Inspections and Cleaning

- The subsurface infiltration systems will be inspected at least once each year by removing the manhole/access port covers and determining the thickness of sediment that has accumulated in the sediment removal row.
- If sediment is more than six inches deep, it must be suspended via flushing with clean water and removed using a vactor truck.
- Manufacturer's specifications and instructions for cleaning the sediment removal row are provided as an attachment to this section.
- Emergency overflow pipes will be examined at least once each year and verified that no blockage has occurred.
- System will be observed after rainfalls to see if it is properly draining.

D.2.3 Stormwater Outfalls

The stormwater drainage system at the Self-Storage Facility has one (1) outfall location where treated stormwater is discharged towards Mill Brook. A map of this location is included in Section E.5 Maintenance Checklists and Device Location Maps.

- Inspect outfall locations monthly for the first three months after construction to ensure proper functioning and correct any areas that have settled or experienced washouts.
- Inspect outfalls annually after initial three month period.
- Annual inspections should be supplemented after large storms, when washouts may occur.
- Maintain vegetation around outfalls to prevent blockages at the outfall.
- Maintain rip rap pad below each outfall and replace any washouts.
- Remove and dispose of any trash or debris at the outfall.

D.2.4 Roof Drain Leader

Roof runoff from buildings and parking areas at the Self-Storage Facility are directed to the bioretention basin and to the subsurface infiltration units.

- Perform routine roof inspections quarterly.
- Keep roofs clean and free of debris.
- Keep roof drainage systems clear.
- Keep roof access limited to authorized personnel.
- Clean inlets twice per year or as necessary.

D.3 Vegetated Stormwater Management Devices

D.3.1 Rain Gardens / Bioretention Basins

The rain gardens at the Self-Storage Facility are excavated shallow surface depressions planted with specially-selected native vegetation to treat and capture runoff. The rain garden also has an overflow structure leading to the subsurface infiltration system to handle larger storm volumes. A location map for the rain garden can be found in Section E.5 Maintenance Checklists and Device Location Maps.

The vegetation in the rain gardens serves to filter runoff — improving water quality and reducing runoff quantity — and the root systems can enhance infiltration. The soil medium filters out pollutants and allows storage and infiltration of stormwater runoff; and the infiltration bed provides additional volume control. Properly designed rain gardens may mimic natural forest ecosystems through species diversity, density and distribution of vegetation, and the use of native species, resulting in a system that is resistant to insects, disease, pollution, and climatic stresses.

Rain gardens require routine maintenance (similar to conventional landscaping maintenance) to ensure that the system both functions well as a stormwater management practice while also maintaining an aesthetic quality compatible with the surrounding land uses.

Replacement of mulch is an important part of rain garden maintenance. Mulch keeps the soil moist, allowing for easy infiltration of rain water. Un-mulched surfaces may develop into a hardpan, a condition in which the soil surface becomes cemented together, forming a hard, impervious layer. Mulching also protects plants and reduces weed growth.

Initial Post-Construction Inspection

- During the initial period of vegetation establishment pruning and weeding are required twice in first year by contractor.
- Any dead vegetation found after the first year must be replaced.
- Proper mulching is mandatory and regular watering may be required initially to ensure proper establishment of new vegetation.

Long-Term Maintenance

- Weeds and invasive plant species shall be removed by hand.
- Leaf litter and other detritus shall be removed twice per year.
- If needed to maintain aesthetic appearance, perennial plantings may be trimmed at the end of the growing season.
- Trees and shrubs should be inspected twice per year to evaluate health and attended to as necessary.
- Re-mulch rain gardens with well aged hardwood mulch to a depth of 3 inches each spring or whenever erosion is evident. The entire area may require mulch replacement once every two to three years. Mulch depth shall not exceed 3 inches and the depth of the depression shall not be compromised by the accumulation of vegetation or old mulch.
- Seeded ground cover or grass areas shall not receive mulching.
- Fertilizers should not be used in the rain garden as excessive nutrients in the rain garden may migrate to the underdrain and be discharged to adjacent surface waters.
- Test pH of the soils in the planting bed annually. If the pH is below 5.2, limestone should be applied to increase it. If the pH is above 8.0, iron sulfate plus sulfur should be added to reduce it.
- Rain gardens may require watering during periods of extended drought.

Inspections and Cleaning

- Rain gardens shall be inspected twice during for the first year and annually thereafter for sediment buildup, erosion, vegetative conditions, etc. If sediment build-up is found, sediment removal and core aeration or cultivating of un-vegetated areas may be required to ensure adequate filtration.

- The inflow location should be inspected annually for clogging. Sediment build up is a common problem where runoff leaves an impervious surface and enters a vegetative or earthen surface. Any built-up sediment should be removed to prevent runoff from bypassing the facility. Sources of sediment should be prevented.
- The overflow structure and underdrain standpipes should be inspected annually to ensure that they are functioning.
- Inspect rain gardens after a large storm event to ensure that proper drainage is occurring. Water that remains ponded on the surface of the rain garden after 48 hours of dry weather could indicate a problem with the subsurface drainage system or clogging of the underdrain. While the plants selected for the rain garden are tolerant of wet soils, they are not wetland species that can survive long periods of inundation. Immediate attention is required to prevent the loss of plant materials.

D.3.2 Vegetated Areas Maintenance

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the functioning of the stormwater management system. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings and proper aeration of soils.

- Inspect planted areas on a semi-annual basis and remove any litter.
- Maintain planted areas adjacent to pavement to prevent soil washout.
- Immediately clean any soil deposited on pavement.
- Re-seed bare areas; install appropriate erosion control measures when native soil is exposed or erosion channels are forming.
- Plant alternative mixture of grass species in the event of unsuccessful establishment.
- The grass vegetation should be cut to a height between three and four inches.
- Pesticide/Herbicide Usage – No pesticides are to be used unless a single spot treatment is required for a specific control application.
- Fertilizer usage should be avoided. If deemed necessary, slow release fertilizer should be used. Fertilizer may be used to begin the establishment of vegetation in bare or damaged areas, but should not be applied on a regular basis unless necessary.
- Annual application of compost amendments and aeration are recommended.

This page intentionally left blank.

Section E: Operations and Maintenance Plan Summary

This page intentionally left blank.

E Operations and Maintenance Plan Summary

This Operation and Maintenance Plan has been prepared in accordance with the Stormwater Management Policy developed by the DEP and CZM and local regulations as applicable. It specifies operational practices and drainage system maintenance requirements for the the Self-Storage Facility redevelopment. Requirements should be adjusted by the site manager as necessary to ensure successful functioning of system components.

E.1 Routine Maintenance Checklists

Routine required maintenance is described in Sections A – D. The following checklists are to be used by the property manager to implement and document the required maintenance and inspection tasks.

E.2 Reporting and Documentation

The site supervisor shall be responsible for ensuring that the scheduled tasks as described in this plan are appropriately completed and recorded in the Maintenance Log. Accurate records of all inspections, routine maintenance and repairs shall be documented and these records shall be available for inspection by members of the Town of Arlington Conservation Commission or other designated body, or their designated agent, upon request.

The Maintenance Log shall:

- Document the completion of required maintenance tasks.
- Identify the person responsible for the completion of tasks.
- Identify any outstanding problems, malfunctions or inconsistencies identified during the course of routine maintenance.
- Document specific repairs or replacements.

E.3 Construction Practices Maintenance/ Evaluation Checklist

Project Name – City, State

Best Management Practice	Inspection Frequency	Date Inspected	Inspector Initials	Minimum Maintenance and Key Items to Check	Cleaning or Repair Needed ☐Yes/No (List Items)	Date of Cleaning or Repair	Performed by:
Compost Filter Tube/Hay Bales/ Silt Fencing	Weekly and after any rainfall			Sediment build up, broken or damaged tubes, bales or stakes			
Gravel Construction Entrance	Weekly and after any rainfall			Filled voids, runoff/sediments into street			
Catch Basin Protection	Weekly and after any rainfall			Clogged or sediment build-up at surface or in basin			
Diversion Channels	Weekly and after any rainfall			Maintained, moved as necessary to correct locations, Check for erosion or breakout			
Temporary Sedimentation Basins	Weekly and after any rainfall			Cracking, erosion, breakout, sediment buildup, contaminants			

Stormwater Control Manager: _____

E.4 Long-term Maintenance/Evaluation Checklist

Project Name – City, State

Best Management Practice	Minimum Maintenance and Key Items to Check	Inspection Frequency	Date Inspected	Inspector Initials	Cleaning Frequency	Cleaning or Repair Needed ☐Yes/No	Date of Cleaning or Repair	Performed by:
Street Sweeping	Vacuum sweeper	4X per year			4X per year* minimum			
Outfall Structures	Remove debris and excess vegetation, replace any dislodged riprap	1X per year			1X per year			
Deep Sump and Hooded Catch basins	Remove sediment 1X per year or if >6 inches	4X per year			1X per year or as necessary			
Subsurface Infiltration Basins	Remove sediment 1X per year or if >6 inches	1X per year			1X per year			
Rain Gardens/ Bioretention Basins	Inspect inlets, vegetation, overflow discharge pipes, drain time less than 4 days	2X per year first year, annually thereafter			2X per year first year, annually thereafter			
Roof Drains	Remove debris, clean inlets draining to subsurface bed	4x per year roof inspection			2x per year inlet cleaning, roof debris as necessary			

* Recommend sweeping Oct/Nov, Feb/Mar, Apr/May Jul/Aug with late winter most important

Stormwater Control Manager: _____

E.5 Maintenance Checklists and Device Location Maps

These checklists are provided for the maintenance crew to photocopy and use when conducting inspections and cleaning activities to the stormwater management systems.

Maintenance Checklists

Catchbasins – Inspect 4 times per year, clean when sediment depth >6 inches or at least once per year.

Catch Basin / Area Drains	Inspected (Y/N)	Sediment Depth (inches)	Cleaning needed (Y/N)	Date Cleaned	Comments (Trash, Oil, Pet waste, Lawn Debris, Damage)
CB 1				/ /	
AD 1				/ /	
AD-2					

Outfalls – Inspect 4 times per year, replace any dislodged rip-rap, remove excess vegetation, remove any debris.

Outfall	Inspected (Y/N)	Sediment Depth (inches)	Cleaning needed (Y/N)	Date Cleaned	Comments (Trash, Oil, Pet waste, Lawn Debris, Damage)
OF 1				/ /	

Infiltration Basins – Inspect once per year, remove sediment if more than 6 inches has accumulated in sediment forebay or sediment collection row.

Basin	Inspected (Y/N)	Sediment Depth (inches)	Cleaning needed (Y/N)	Date Cleaned	Comments (Trash, Oil, Pet waste, Lawn Debris, Damage)
IB 1				/ /	

Rain Gardens/Bioretention Basins – Inspect twice during first year and annually thereafter for sediment buildup, erosion, vegetative conditions, etc. If sediment build-up is found, core aeration or cultivating of unvegetatd areas may be required to ensure adequate filtration. The overflow should be inspected annually to ensure that it is functioning.

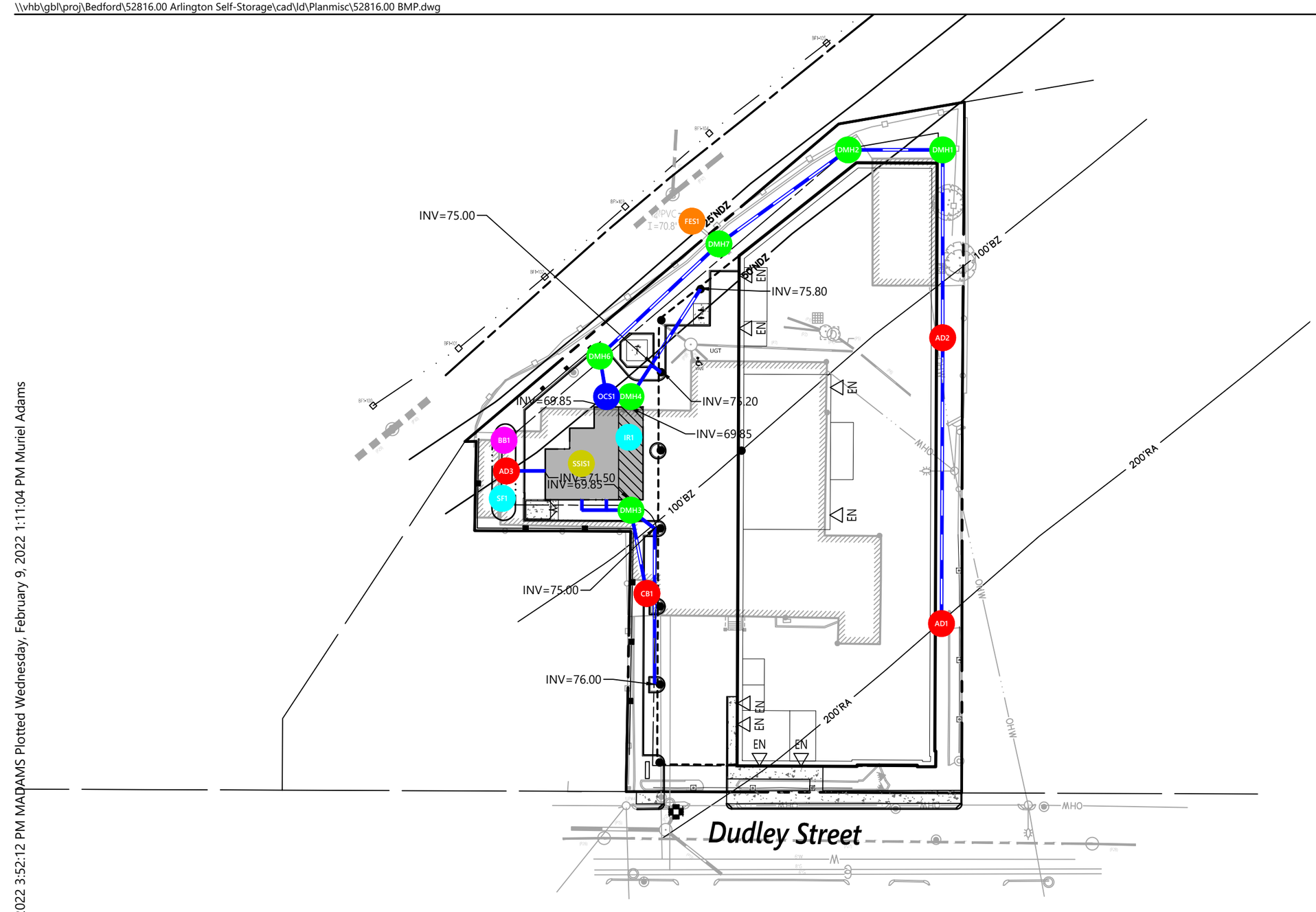
Rain Garden	Inspected (Y/N)	Sediment Depth (inches)	Cleaning needed (Y/N)	Date Cleaned	Comments (Trash, Oil, Pet waste, Lawn Debris, Damage)
RG 1				/ /	

Roof Runoff Downspouts – Inspect roof drains monthly, clean inlets draining to the subsurface bed twice per year.

Bldg #	Inspected (Y/N)	Sediment Depth (inches)	Cleaning needed (Y/N)	Date Cleaned	Comments (Trash, Oil, Pet waste, Lawn Debris, Damage)
Bldg 1				/ /	

Device Location Map

Plotted Friday, February 4, 2022 3:52:12 PM MADAMS Plotted Wednesday, February 9, 2022 1:11:04 PM Muriel Adams



Legend

- CB = CATCH BASIN
  AD = AREA DRAIN
- OCS — OUTLET CONTROL STRUCTURE
- SSIS — SUBSURFACE INFILTRATION SYSTEM
- DMH — DRAINAGE MANHOLES
- FES — FLARED END SECTION / OUTFALL
- BB — BIORETENTION BASIN
- IR = ISOLATOR ROW
  SF = SEDIMENT FOREBAY
- DRAINAGE PIPES

0 50 100 Feet

Proposed Self Storage Facility
34 Dudley Street
Arlington, MA
Project #: 52816.00

Figure 1

02/09/2022

This page intentionally left blank.

Snow Storage Areas Map

Plotted Wednesday, February 9, 2022 1:13:54 PM MADAMS Plotted Wednesday, February 9, 2022 2:11:44 PM Muriel Adams

Legend

SNOW STORAGE AREA

SNOW STORAGE

25'NDZ

50'NDZ

100'BZ

100'BZ

200'RA

200'RA

S10P

Dudley Street

0 50 100 Feet

Proposed Self Storage Facility
34 Dudley Street
Arlington, MA
Project #: 52816.00

Figure 2

02/09/2022

Section F: Product Literature

This page intentionally left blank.

StormTech MC-4500 Chamber

MC-4500 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots, thus maximizing land usage for commercial and municipal applications.



StormTech MC-4500 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)	52" (1321 mm) x 100" (2540 mm) x 60" (1524 mm)
Chamber Storage	106.5 ft³ (3.01 m³)
Min. Installed Storage*	192.8 ft³ (4.60 m³)
Weight	120 lbs (54.4 kg)

*This assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below chambers, 9" (230 mm) between stone bed/end caps and 40% stone porosity.

StormTech MC-4500 End Cap (not to scale)

Nominal Chamber Specifications

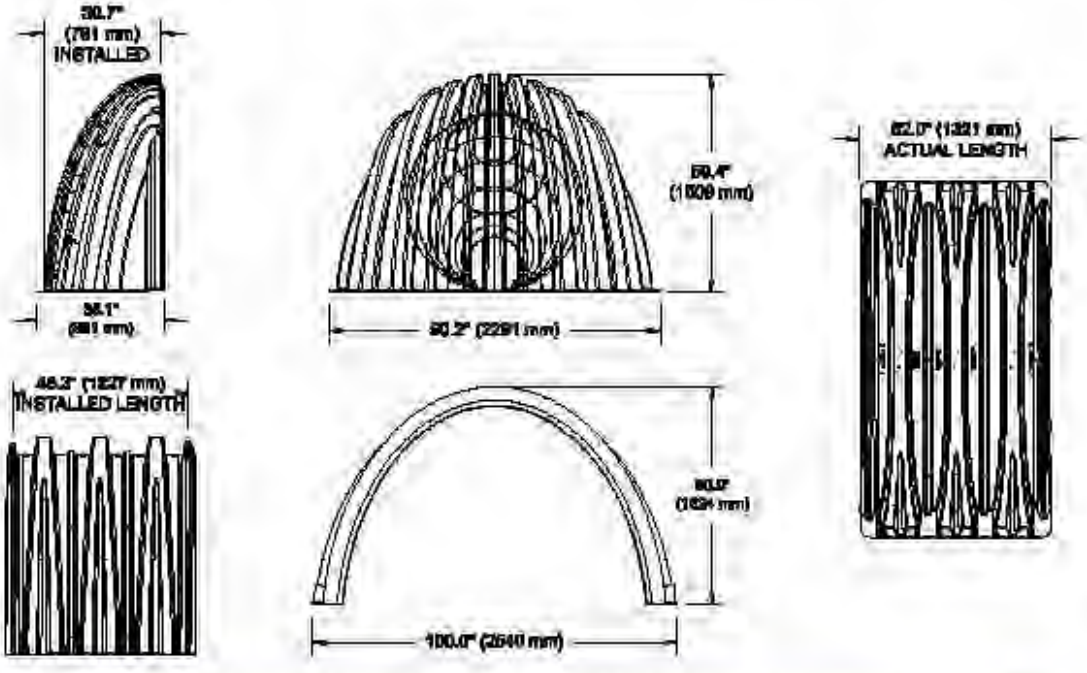
Size (L x W x H)	35.1" (891 mm) x 90.2" (2291 mm) x 59.4" (1509 mm)
Chamber Storage	35.7 ft³ (1.01 m³)
Min. Installed Storage*	104.7 ft³ (2.96 m³)
Weight	128 lbs (54.4 kg)

*This assumes a minimum of 12" (300 mm) of stone above, 9" (230 mm) of stone below, 6" (150 mm) of stone perimeter, 9" (230 mm) between chamber/end caps and 40% stone porosity.

Shipping

7 chambers/pallet

11 pallets/truck



StormTech MC-4500 Chamber

Storage Volume Per Chamber/End Cap ft³ (m³)

	Bare Unit Storage ft³ (m³)	Chamber/End Cap and Stone Volume — Stone Foundation Depth in. (mm)			
		9 (230)	12 (300)	15 (375)	18 (450)
MC-4500 Chamber	106.5 (3.02)	162.6 (4.60)	166.3 (4.71)	169.9 (4.81)	173.6 (4.91)
MC-4500 End Cap	35.7 (1.01)	108.7 (3.08)	111.9 (3.17)	115.2 (3.26)	118.4 (3.35)

NOTE: Assumes 9" (230 mm) row spacing, 40% stone porosity, 12" (300 mm) stone above and includes the bare chamber/end cap volume. End cap volume assumes 12" (300 mm) stone perimeter.

Amount of Stone Per Chamber

ENGLISH tons (yd³)	Stone Foundation Depth			
	9"	12"	15"	18"
MC-4500	7.4 (5.2)	7.8 (5.5)	8.3 (5.9)	8.8 (6.2)
End Cap	9.6 (6.8)	10.0 (7.1)	10.4 (7.4)	10.9 (7.7)
METRIC kg (m³)	230 mm	300 mm	375 mm	450 mm
MC-4500	6681 (4.0)	7117 (4.2)	7552 (4.5)	7987 (4.7)
End Cap	8691 (5.2)	9075 (5.4)	9460 (5.6)	9845 (5.9)

NOTE: Assumes 12" (300 mm) of stone above, and 9" (230 mm) row spacing, and 12" (300 mm) of perimeter stone in front of end caps.

Volume of Excavation Per Chamber/End Cap yd³ (m³)

	Stone Foundation Depth			
	9" (230 mm)	12" (300 mm)	15"(375 mm)	18"(450 mm)
MC-4500	10.5 (8.0)	10.8 (8.3)	11.2 (8.5)	11.5 (8.8)
End Cap	9.3 (7.1)	9.6 (7.3)	9.9 (7.6)	10.2 (7.8)

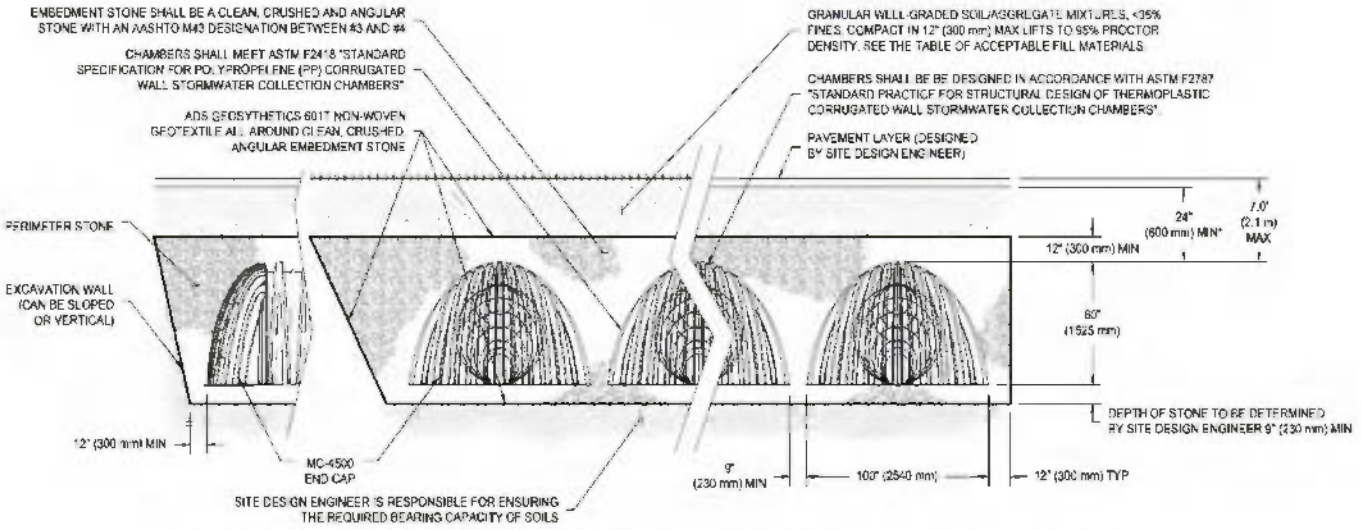
NOTE: Assumes 9" (230 mm) separation between chamber rows, 12" (300 mm) of perimeter in front of end caps, and 24" (600 mm) of cover. The volume of excavation will vary as the depth of cover increases.







General Cross Section



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm)

Special applications will be considered on a project by project basis. Please contact our application department should you have a unique application for our team to evaluate.

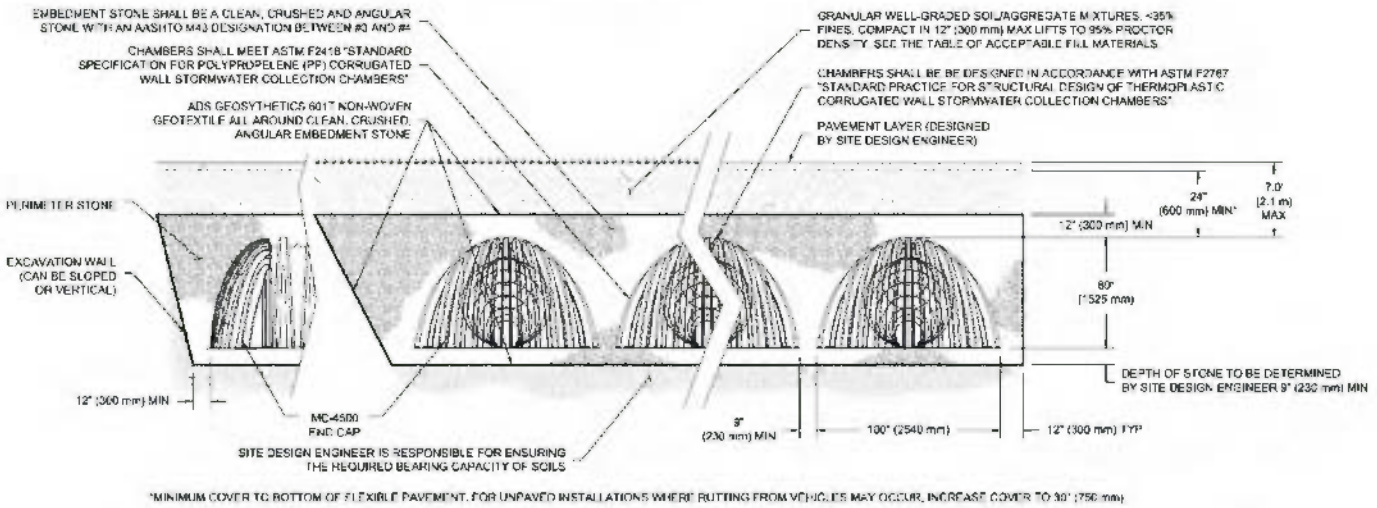
2.0 Foundations for Chambers

TABLE 2—MC-4500 Minimum Required Foundation Depth in inches (millimeters)
Assumes 9" (230 mm) row spacing.

Cover Ht. ft. (m)	Minimum Bearing Resistance for Service Loads ksf (kPa)																								
	4.4 (211)	4.3 (206)	4.2 (201)	4.1 (196)	4.0 (192)	3.9 (187)	3.8 (182)	3.7 (177)	3.6 (172)	3.5 (168)	3.4 (163)	3.3 (158)	3.2 (153)	3.1 (148)	3.0 (144)	2.9 (139)	2.8 (134)	2.7 (129)	2.6 (124)	2.5 (120)	2.4 (115)	2.3 (110)	2.2 (105)	2.1 (101)	2.0 (96)
2.0 (0.61)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)
2.5 (0.76)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	18 (450)	18 (450)	24 (600)
3.0 (0.91)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)
3.5 (1.07)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)
4.0 (1.22)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)
4.5 (1.37)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)
5.0 (1.52)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)	36 (900)
5.5 (1.68)	9 (230)	9 (230)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)	36 (900)	36 (900)
6.0 (1.83)	9 (230)	9 (230)	9 (230)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)	30 (750)	36 (900)	36 (900)	36 (900)
6.5 (1.98)	9 (230)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)	30 (750)	36 (900)	36 (900)	36 (900)	42 (1050)
7.0 (2.13)	12 (300)	12 (300)	12 (300)	12 (300)	15 (375)	15 (375)	15 (375)	15 (375)	18 (450)	18 (450)	18 (450)	24 (600)	24 (600)	24 (600)	24 (600)	24 (600)	30 (750)	30 (750)	30 (750)	30 (750)	36 (900)	36 (900)	36 (900)	42 (1050)	42 (1050)

NOTE: The design engineer is solely responsible for assessing the bearing resistance (allowable bearing capacity) of the subgrade soils and determining the depth of foundation stone. Subgrade bearing resistance should be assessed with consideration for the range of soil moisture conditions expected under a stormwater system.

FIGURE 10B—MC-4500 Structural Cross Section Detail (Not to Scale)



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm)

Special applications will be considered on a project by project basis. Please contact our applications department should you have a unique application for our team to evaluate.

3.1 Foundation and Embedment Stone

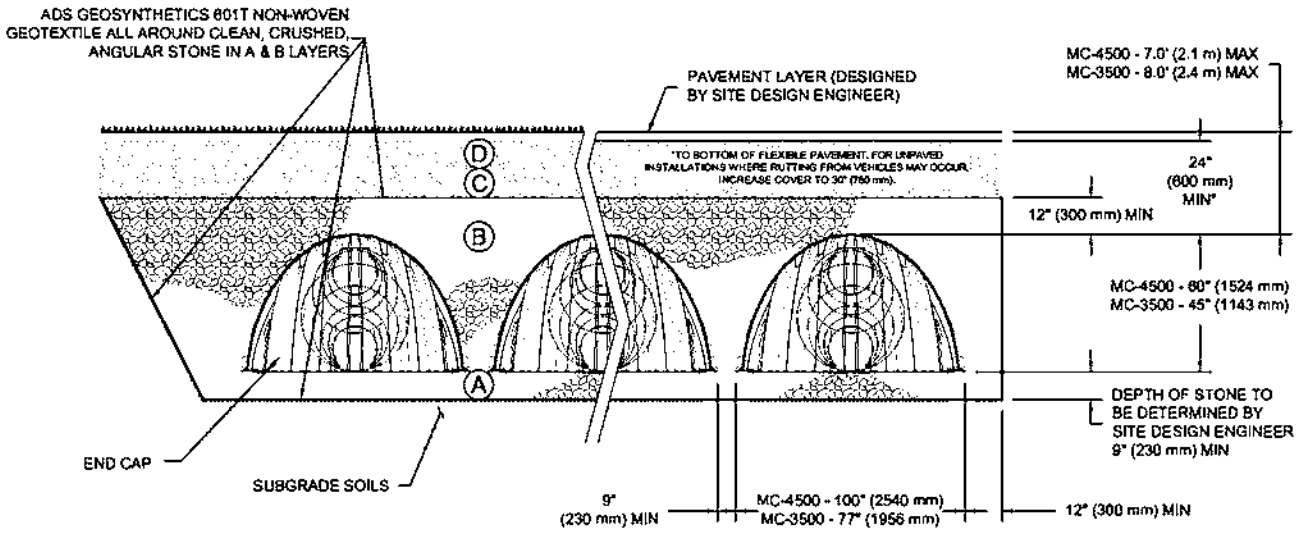
The stone surrounding the chambers consists of the foundation stone below the chambers and embedment stone surrounding the chambers. The foundation stone and embedment stone are important components of the structural system and also provide open void space for stormwater storage. **Table 3** provides the stone specifications that achieve both structural requirements and a porosity of 40% for stormwater storage. **Figure 11** specifies the extents of each backfill stone location.

TABLE 3—Acceptable Fill Materials

	MATERIAL LOCATION	DESCRIPTION	AASHTO DESIGNATION	COMPACTION/DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1,A-2-4,A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL-GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.

FIGURE 11—Fill Material Locations



Once layer 'C' is placed, any soil/material can be placed in layer 'D' up to the finished grade. Most pavement subbase soils can be used to replace the materials of layer 'C' or 'D' at the design engineer's discretion.

4.1 GENERAL

StormTech subsurface chamber systems offer the flexibility for a variety of inlet and outlet configurations. Contact the StormTech Technical Services Department or your local StormTech representative for assistance configuring inlet and outlet connections.

The open graded stone around and under the chambers provides a significant conveyance capacity ranging from approximately 0.8 cfs (23 l/s) to 13 cfs (368 l/s) per MC-3500 chamber and 0.54 cfs (15 l/s) to 8.5 cfs (240 l/s) for the MC-4500 chamber. The actual conveyance capacity is dependent upon stone size, depth of foundation stone and head of water. Although the high conveyance capacity of the open graded stone is an important component of the flow network, StormTech recommends that a system of inlet and outlet manifolds be designed to distribute and convey the peak flow through the chamber system.

It is the responsibility of the design engineer to provide the design flow rates and storage volumes for the stormwater system and to ensure that the final design meets all conveyance and storage requirements. However, StormTech will work with the design engineer to assist with manifold and chamber layouts that meet the design objectives.

4.2 THE ISOLATOR® ROW

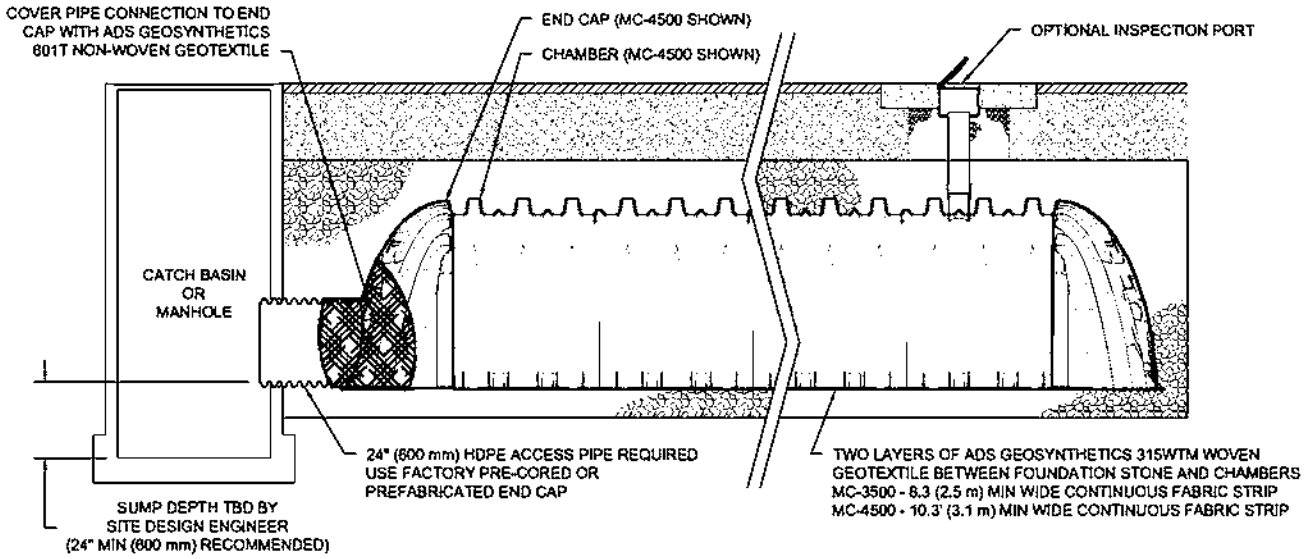
The Isolator Row is a patented system that inexpensively captures total suspended solids (TSS) and debris and provides easy access for inspection and maintenance. A double layer of woven geotextile between the bottom of the chambers and the foundation stone provides the filter media that satisfies most contaminant removal objectives. Each installed MC-3500 chamber and MC-3500 end cap provides 42.9 ft2 (4.0 m2) and 7.5 ft2 (0.7 m2) of bottom filter area respectively. Each installed MC-4500 chamber and MC-4500 end cap provides 30.1 ft² (2.80 m²) and 12.8 ft² (1.19 m²) of bottom filter area respectively.

The Isolator Row can be configured for maintenance objectives or, in some regulatory jurisdictions, for water quality objectives. For water quality applications, Isolator Rows can be sized based on water quality volume or flow rate.

All Isolator Rows require: 1) a manhole for maintenance access, 2) a means of diversion of flows to the Isolator Row and 3) a high flow bypass. Flow diversion can be accomplished by either a weir in the upstream access manhole or simply by feeding the Isolator Row at a lower elevation than the high flow bypass. Contact StormTech for assistance sizing Isolator Rows.

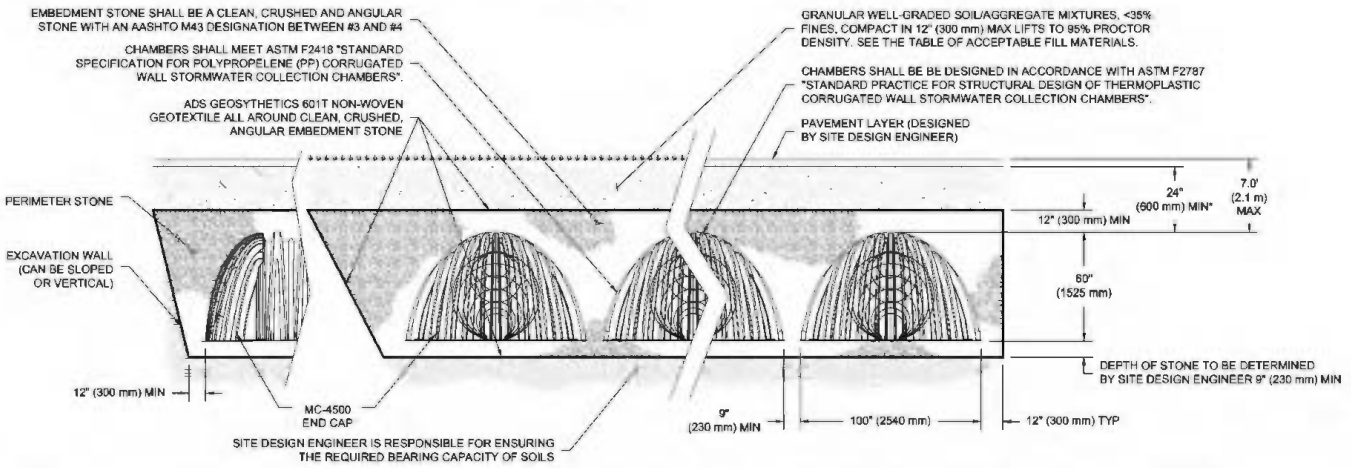
When additional stormwater treatment is required, StormTech systems can be configured using a treatment train approach where other stormwater BMPs are located in series.

FIGURE 12—StormTech Isolator Row Detail



7.0 Structural Cross Sections and Specifications

FIGURE 16—MC-4500 Structural Cross Section Detail (Not to Scale)



*MINIMUM COVER TO BOTTOM OF FLEXIBLE PAVEMENT. FOR UNPAVED INSTALLATIONS WHERE RUTTING FROM VEHICLES MAY OCCUR, INCREASE COVER TO 30" (750 mm).

Special applications will be considered on a project by project basis. Please contact our application department should you have a unique application for our team to evaluate.

MC-4500 STORMWATER CHAMBER SPECIFICATIONS

1. Chambers shall be StormTech MC-4500 or approved equal.
2. Chambers shall be made from virgin, impact-modified polypropylene copolymers.
3. Chamber rows shall provide continuous, unobstructed internal space with no internal panels that would impede flow.
4. The structural design of the chambers, the structural backfill and the installation requirements shall ensure that the load factors specified in the AASHTO LRFD Bridge Design Specifications, Section 12.12 are met for: 1) long-duration dead loads and 2) short-duration live loads, based on the AASHTO Design Truck with consideration for impact and multiple vehicle presences.
5. Chambers shall meet the requirements of ASTM F 2418, "Standard Specification for Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers."
6. Chambers shall conform to the requirements of ASTM F 2787, "Standard Practice for Structural Design of Thermoplastic Corrugated Wall Stormwater Collection Chambers."
7. Only chambers that are approved by the engineer will be allowed. The contractor shall submit (3 sets) of the following to the engineer for approval before delivering chambers to the project site:
   - A structural evaluation by a registered structural engineer that demonstrates that the load factors specified in the AASHTO LRFD Bridge Design Specifications, Section 12.12 are met. The 50-year creep modulus data specified in ASTM F 2418 must be used as part of the AASHTO structural evaluation to verify long-term performance.
   - Structural cross section detail on which the structural cross section is based.
8. The installation of chambers shall be in accordance with the manufacturer's latest Construction Guide.

Detail drawings available in Cad Rev. 2000 format at www.stormtech.com

This page intentionally left blank.

Water Quality Volume Calculations

Water Quality Volume Calculations

Project	Arlington Self Storage	**Project #**	52816.00
Calculated by	SJH	**Date**	2/3/2022
Checked by	EKG	**Date**	2/7/2022

BASIN #1

Runoff from subcatchment areas PR-1, PR-3, PR-4

Water Quality Storm Runoff Depth	(in)	0.5
Total Impervious Area	(ft^2)	25,700

BASIN WQV:

Required Volume:

Runoff Depth to be Treated (in)	Required Volume (ft^3)
0.5	**1,071**

Provided Volume:

Elevation	Area (ft^2)	Cumulative Volume (ft^3)
69.1	1,112	0
71.7	1,112	**1,954**

** Per MassDEP Treatment Requirement*

TSS Removal Worksheets

TSS Removal Calculation Worksheet

101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
P 617.924.1770

Project Name:	**Arlington Self Storage**	Sheet:	**1 of 2**
Project Number:	**52816.00**	Date:	**Janaury 4, 2022**
Location:	**Arlington, MA**	Computed by:	**SJH**
Discharge Point:	**DP-2**	Checked by:	
Drainage Area(s):	**PR-1, PR-3**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Isolator Row	**25%**	**75%**	**19%**	**56%**
	0%	**56%**	**0%**	**56%**

Pre-Treatment TSS Removal = **44%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Deep Sump and Hooded Catch Basin	**25%**	**100%**	**25%**	**75%**
Subsurface Infiltration Structure	**80%**	**75%**	**60%**	**15%**
	0%	**15%**	**0%**	**15%**
	0%	**15%**	**0%**	**15%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).

** Equals remaining load from previous BMP (E)

*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 80% removal is used for this calculation (Change name of device and the claimed removal rate shown on the calc. sheet. Remove this sentence if

Treatment Train TSS Removal = **85%**

101 Walnut Street
Post Office Box 9151
Watertown, MA 02471
P 617.924.1770

TSS Removal Calculation Worksheet

Project Name:	**Arlington Self Storage**	Sheet:	**2 of 2**
Project Number:	**52816.00**	Date:	**February 9, 2022**
Location:	**Arlington, MA**	Computed by:	**MEA**
Discharge Point:	**DP-2**	Checked by:	
Drainage Area(s):	**PR-4**		

1. Pre-Treatment prior to Infiltration

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Sediment Forebay	**25%**	**100%**	**25%**	**75%**
	0%	**75%**	**0%**	**75%**
	0%	**75%**	**0%**	**75%**
		Pre-Treatment TSS Removal =		**25%**

2. Total TSS Removal including Pretreatment 1.

BMP*	TSS Removal Rate*	Starting TSS Load**	Amount Removed (C*D)	Remaining Load (D-E)
Bioretention Area	**90%**	**100%**	**90%**	**10%**
	0%	**10%**	**0%**	**10%**
	0%	**10%**	**0%**	**10%**
	0%	**10%**	**0%**	**10%**

* BMP and TSS Removal Rate Values from the MassDEP Stormwater Handbook Vol. 1. Removal rates for proprietary devices are from approved studies and/or manufacturer data (attach study or data source, or remove this sentence if not applicable).

** Equals remaining load from previous BMP (E)

*** Stormceptor sizing calculation gives a TSS removal rate of 87%. To be conservative, 80% removal is used for this calculation (Change name of device and the claimed removal rate shown on the calc. sheet. Remove this sentence if

Treatment Train TSS Removal = 308 of 360 **90%**

Appendix E: Standard 7 Supporting Information

This page intentionally left blank.

The Project has been designed to comply with all ten of the Stormwater Management Standards. There is no required Standard 7 Supporting Information. This page intentionally left blank.

Appendix F: Standard 8 Supporting Information

Recommended Construction Period Pollution Prevention and Erosion and Sedimentation Controls

Proposed Self Storage Facility Project

34 Dudley Street

Arlington, Massachusetts, 02476

PREPARED FOR

PSI Atlantic Arlington MA, LLC
530 Oak Court Drive, Suite 155
Memphis, TN 38117

PREPARED BY

2 Bedford Farms Drive
Suite 200
Bedford, NH 03110
603.391.3900

February 2022

Table of Contents

1 **Erosion and Sedimentation Control Plan 1**

Erosion and Sedimentation Control Measures 1
Hay Bale Barriers 2
Silt Fencing 2
Compost Berms 2
Catch Basin Protection 3
Gravel and Construction Entrance/Exit 3
Diversion Channels 3
Temporary Sediment Basins 3
Vegetative Slope Stabilization 3
Maintenance 3
Spill Prevention and Response Plan 4
Initial Notification 4
Further Notification 4
Emergency Notification Phone Numbers 5
Hazardous Waste / Oil Spill Report 6
Assessment – Initial Containment 7
Emergency Response Equipment 7
Photo Groupings ..... **Error! Bookmark not defined.**

Appendices .....

Divider ..... **Error! Bookmark not defined.**

List of Tables

Table No.	Description	Page
Table 1	Table_Title	**Error! Bookmark not defined.**
Table 2	Table_Title_Wide	**Error! Bookmark not defined.**

List of Figures

Figure No.	Description	Page
Figure 1	Figure Title	**Error! Bookmark not defined.**
Figure 2	Figure Title_Wide	**Error! Bookmark not defined.**

1

Erosion and Sedimentation Control Plan

As part of the Site Plan Review and Notice of Intent process, an erosion and sedimentation control plan will be developed, and will include measures such as those described below.

Erosion and Sedimentation Control Measures

An Erosion and Sediment Control Plan has been designed to ensure compliance with the MassDEP Stormwater Management Policy and Town of Arlington Bylaws and Regulations. The Project will disturb less than 1-acre of land and not subject to the NPDES General Permit for Stormwater Discharges from Construction Activities. The following minimum performance standards have been included in the Erosion and Sediment Control Plan attached to this report.

1. Erosion control structures will be located at the edge of land disturbances and will be designed so as not to create point discharges onto abutting properties.
2. Dust from all earthmoving activities shall be controlled.
3. Earth materials shall not be deposited onto any roadways.
4. The amount of disturbed area shall be minimized. Natural resources shall protected.
5. Vegetative stabilization measures shall be employed during the Regulated Activity and construction activity as required by the approving authority. All perimeter dikes and slopes, basin or trap embankments shall be stabilized with sod, seed, anchored mulch within seven (7) days of disturbance. All other disturbed areas shall be stabilized with sod, seed and anchored mulch within fourteen (14) days after disturbing activities are ceased.
6. Topsoil shall be stripped from disturbed areas and stockpiled in an approved area and stabilized with a temporary vegetative cover if left more than fifteen (15) calendar days. Perimeter sediment controls shall be installed around stockpiled topsoil.

7. During cold weather months, when seeding and sodding may be impractical, anchored mulch shall be applied as approved.
8. All storm drain inlets shall be protected, and all newly constructed outlets shall be armored in accordance with the above-mentioned guidelines.
9. Perimeter controls shall be used at the site.
10. All construction site entrances and exits shall be stabilized to prevent off-site tracking.
11. Stormwater controls shall be inspected at consistent intervals, including during or immediately after a storm.
12. Construction site operators shall control all construction and waste materials.

The following erosion and sedimentation controls are for use during the earthwork and construction phases of the project. The following controls are provided as recommendations for the site contractor and do not constitute or replace the final Stormwater Pollution Prevention Plan that must be fully implemented by the Contractor and owner in Compliance with EPA NPDES regulations.

Compost Filter Tube (Perimeter Control)

Siltsock shall be installed around the project work limits as perimeter controls. Siltsocks shall be as manufactured by *Filtrexx* or approved equivalent. Approved siltsocks shall be composed of 12 inch diameter biodegradable mesh netting and filled with a compostable material. When installing multiple sections of siltsock, each individual section shall overlap a minimum of 12 inches. Since siltsocks shall be installed on top of the ground, without being trenched in, the Contractor shall install a supplemental compostable material on the up-slope side of the siltsock, in order to prevent the flow of stormwater runoff beneath it.

Siltsocks will be inspected in compliance with the inspection schedule and maintained routinely throughout the duration of the project. The contractor must remove sediment before it accumulates to one-half of the above-ground height of any perimeter control. Additionally, sections of siltsock that appear to be damaged, removed, or of which the stakes have been removed, shall be repaired immediately upon observation.

Hay Bale Barriers

Hay bale barriers will be placed to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site. Bales will be set at least four inches into the existing ground to minimize undercutting by runoff.

Silt Fencing

In areas where high runoff velocities or high sediment loads are expected, hay bale barriers will be backed up with silt fencing. This semi permeable barrier made of a synthetic porous fabric will provide additional protection. The silt fences and hay bale barrier will be replaced as determined by periodic field inspections.

Catch Basin Protection

Newly constructed and existing catch basins will be protected with hay bale barriers (where appropriate) or silt sacks throughout construction.

Gravel and Construction Entrance/Exit

A temporary crushed-stone construction entrance/exit will be constructed. A cross slope will be placed in the entrance to direct runoff to a protected catch basin inlet or settling area. If deemed necessary after construction begins, a wash pad may be included to wash off vehicle wheels before leaving the project site.

Diversion Channels

Diversion channels will be used to collect runoff from construction areas and discharge to either sedimentation basins or protected catch basin inlets.

Temporary Sediment Basins

Temporary sediment basins will be designed either as excavations or bermed stormwater detention structures (depending on grading) that will retain runoff for a sufficient period of time to allow suspended soil particles to settle out prior to discharge. These temporary basins will be located based on construction needs as determined by the contractor and outlet devices will be designed to control velocity and sediment. Points of discharge from sediment basins will be stabilized to minimize erosion.

Vegetative Slope Stabilization

Stabilization of open soil surfaces will be implemented within 14 days after grading or construction activities have temporarily or permanently ceased, unless there is sufficient snow cover to prohibit implementation. Vegetative slope stabilization will be used to minimize erosion on slopes of 3:1 or flatter. Annual grasses, such as annual rye, will be used to ensure rapid germination and production of root mass. Permanent stabilization will be completed with the planting of perennial grasses or legumes. Establishment of temporary and permanent vegetative cover may be established by hydro seeding or sodding. A suitable topsoil, good seedbed preparation, and adequate lime, fertilizer and water will be provided for effective establishment of these vegetative stabilization methods. Mulch will also be used after permanent seeding to protect soil from the impact of falling rain and to increase the capacity of the soil to absorb water.

Maintenance

› The contractor or subcontractor will be responsible for implementing each control shown on the Sedimentation and Erosion Control Plan. In accordance with EPA regulations, the contractor must sign a copy of a certification to verify that a plan has been prepared and that permit regulations are understood.

- The on site contractor will inspect all sediment and erosion control structures periodically and after each rainfall event. Records of the inspections will be prepared and maintained on site by the contractor.
- Silt shall be removed from behind barriers if greater than 6 inches deep or as needed.
- Damaged or deteriorated items will be repaired immediately after identification.
- The underside of hay bales should be kept in close contact with the earth and reset as necessary.
- Sediment that is collected in structures shall be disposed of properly and covered if stored on site.
- Erosion control structures shall remain in place until all disturbed earth has been securely stabilized. After removal of structures, disturbed areas shall be regraded and stabilized as necessary

The sedimentation and erosion control plan is included in project plan set; a reduced version and Erosion Control Maintenance checklist is included here for quick reference.

Spill Prevention and Response Plan

Spill prevention equipment and training will be provided by the Contractor.

Initial Notification

In the event of a spill the facility and/or construction manager or supervisor will be notified immediately.

Facility Manager

Name:	_____	Home Phone:	_____
Phone:	_____	E-mail:	_____

Construction Manager

Name:	_____	Home Phone:	_____
Phone:	_____	E-mail:	_____

The supervisor will first contact the Fire Department and then notify the Police Department, the Public Health Commission and the Conservation Commission. The Fire Department is ultimately responsible for matters of public health and safety and should be notified immediately.

Further Notification

Based on the assessment from the Fire Chief, additional notification to a cleanup contractor may be made. The Massachusetts Department of Environmental Protection (DEP) and the

EPA may be notified depending upon the nature and severity of the spill. The Fire Chief will be responsible for determining the level of cleanup and notification required. The attached list of emergency phone numbers shall be posted in the main construction/facility office and readily accessible to all employees. A hazardous waste spill report shall be completed as necessary using the attached form.

Emergency Notification Phone Numbers

1. Facility Manager

Name:	_____	Home Phone:	_____
Phone:	_____	E-mail:	_____

Alternate

Name:	_____	Home Phone:	_____
Phone:	_____	E-mail:	_____

2. Fire Department

   Emergency: 911

   Business: _____

   Police Department

   Emergency: 911

   Business: _____

3. Cleanup Contractor

   Address: _____

   Phone: _____

4. Massachusetts Department of Environmental Protection

   Emergency: _____

   Northeast Region: _____

5. National Response Center

   Phone: (800) 424-8802

   Alternate U.S. Environmental Protection Agency

   Emergency: (800) 424-8802

   Business: _____

6. Arlington Conservation Commission

   Contact: _____

   Phone: (781) 316-3090

7. Arlington Health Department

   Contact: Natasha Waden (Director)

   Phone: (781) 316-3170

Hazardous Waste / Oil Spill Report

Date	_____	Time	_____	AM / PM	
Exact Location (Transformer #)	_____				
Type of Equipment	_____	Make	_____	Size	_____
S/N	_____	Weather Conditions	_____		
On or near water	☐ Yes ☐ No	If Yes, name of body of water	_____		
Type of chemical/oil spilled	_____				
Amount of chemical/oil spilled	_____				
Cause of spill	_____				
Measures taken to contain or clean up spill	_____				
Amound of chemical/oil recovered	_____	Method	_____		
Material collected as a result of cleanup:					
_____	Drums containing	_____			
_____	Drums containing	_____			
_____	Drums containing	_____			
Location and method of debris disposal:					
_____					
Name and address of any person, firm, or corporation suffering damages:					
_____					
Procedures, method, and precautions instituted to prevent a similar occurrence from recurring:					
_____					
Spill reported to General Office by	_____	Time	_____	AM/PM	
Spill reported to DEP / Natrional Response Center by				_____	
DEP Date	_____	Time	_____	AM/PM	Inspector _____
NRC Date	_____	Time	_____	AM/PM	Inspector _____
Additional comments:	_____				

Assessment – Initial Containment

The supervisor or manager will assess the incident and initiate containment control measures with the appropriate spill containment equipment included in the spill kit kept on-site. A list of recommended spill equipment to be kept on site is included on the following page.

Fire / Police Department:		911
Arlington Health Department:		(781) 316-3170
Arlington Conservation Commission:		(781) 316-3090

Emergency Response Equipment

The following equipment and materials shall be maintained at all times and stored in a secure area for long-term emergency response need.

Supplies		Recommended Suppliers
SORBENT PILLOWS/"PIGS"	2	http://www.newpig.com
SORBENT BOOM/SOCK	25 FEET	Item # KIT276 — mobile container with two pigs, 26 feet of sock, 50 pads, and five pounds of absorbent (or equivalent) http://www.forestry-suppliers.com
SORBENT PADS	50	
LITE-DRI® ABSORBENT	5 POUNDS	
SHOVEL	1	Item # 33934 — Shovel (or equivalent)
PRY BAR	1	Item # 43210 — Manhole cover pick (or equivalent)
GOGGLES	1 PAIR	Item # 23334 — Goggles (or equivalent)
GLOVES – HEAVY	1 PAIR	Item # 90926 — Gloves (or equivalent)

Request for Determination of Applicability: 99 Sunnyside Avenue

Summary:
This public hearing will consider a Request for Determination of Applicability for renovations to the private residence located at 99 Sunnyside Avenue. Work is proposed to be conducted within the 200-Foot Riverfront Area and 100-foot Buffer Zone to Alewife Brook as well as Bordering Land Subject to Flooding (FEMA Zone AE). Renovation includes new framing, siding, roofing, and interior renovation, as well as replacement of an existing impervious private walkway.

Town of Arlington, Massachusetts

Notice of Intent: Colonial Village Drive (Continuation)

Summary:
This public hearing will consider a Notice of Intent to reconstruct all on-site parking and access driveways and curbing, as well as installation of stormwater management systems and conduct site grading at Colonial Village Drive. All work is proposed to be conducted within the 100-foot Buffer Zone to the Inland Bank of a perennial stream that flows from the Arlington Reservoir, the 200-foot Riverfront Area associated with Mill Brook, and Bordering Land Subject to Flooding (FEMA Zone AE).

ATTACHMENTS:

	Type	File Name	Description
🗋	Reference Material	Correspondence_between_Ryan_Landers_and_Wayne_Chouinard.pdf	Correspondence between Ryan Landers and Wayne Chouinard

Subject: RE: NOI Filing - Colonial Village Drive
From: Ryan Landers <rlanders@mckeng.com>
Date: 2/9/2022, 11:38 AM
To: Wayne Chouinard <WChouinard@town.arlington.ma.us>
CC: Bill Copithorne <wcopithorne@town.arlington.ma.us>, David Morgan <dmorgan@town.arlington.ma.us>, Teresa Debenedictis <TDebenedictis@town.arlington.ma.us>, Dan Stoneking <DStoneking@town.arlington.ma.us>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.

Wayne,

See attached Stormwater Report and Grading plan (C-3) showing 'Bottom of Brook' spot elevations. At this time, the current plans include all the information we have regarding the existing closed drainage system on site. We do calculate a net increase in flood storage as a result of the proposed work. The 'Compensatory Storage Volume (Under Elevation 154.0)' table can be found in the project narrative of our Notice of Intent.

Regarding these other items, I will inform the Property Management company and see whether or not they wish to include these items within this project.

Regards,

Ryan Landers, E.I.T.
Project Engineer
MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: Wayne Chouinard <WChouinard@town.arlington.ma.us>
Sent: Tuesday, February 8, 2022 5:28 PM
To: Ryan Landers <rlanders@mckeng.com>
Cc: Bill Copithorne <wcopithorne@town.arlington.ma.us>; David Morgan <dmorgan@town.arlington.ma.us>; Teresa Debenedictis <TDebenedictis@town.arlington.ma.us>; Dan Stoneking <DStoneking@town.arlington.ma.us>
Subject: RE: NOI Filing - Colonial Village Drive

Ryan,

Could you provide a copy of the drainage report and include the additional elevations on the plan so that I may complete my review?

Also, please review and consider the following items:

1) why there is no flood volume planned to offset flooding? Flood Storage could be provide **without** a 2-ft offset with some minor design improvements.

2) be aware that Mill Brook and the conveyance through the property are the responsibility of Colonial Village. If work is going to be performed, it may be worth considering maintaining and or repairing the brook channel. Otherwise, if the walls crumble, it could affect work performed in the driveway/pavement.

3) The Town is required to perform a building inspection for all structures in Town to determine if there are sump pumps, floor drains and/or illicit connections to Town Infrastructure. If during these inspections it is found that there are sump pumps etc, there may be requirements to provide alternatives to any pipe configuration within the buildings and it would be best to incorporate any required work into the current project so as to not impact the project after the driveway/paving has been completed.

Would you be able to coordinate for the Town to gain access and perform the required inspection of each building?

Thank you,

Wayne

Wayne A. Chouinard, PE
Town Engineer
Arlington Public Works
51 Grove Street
Office: (781) 316-3320
E-mail: wchouinard@town.arlington.ma.us

> From: Ryan Landers <rlanders@mckeng.com>
> To: Wayne Chouinard <WChouinard@town.arlington.ma.us>
> Cc: Bill Copithorne <wcopithorne@town.arlington.ma.us>, David Morgan <dmorgan@town.arlington.ma.us>
> Date: Tue, 8 Feb 2022 14:47:42 +0000
> Subject: RE: NOI Filing - Colonial Village Drive
>
> CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
>
> CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.
>
> Hi Wayne,
>
> We do not show a hydrological report with the idea that we are maintaining existing runoff patterns and simply creating 5 low points along the Mill Brook channel to alleviate ponding issues on site. Impervious coverage and total area contributing to Mill Brook will remain unchanged.
>
> Soil test pits were conducted throughout the site and found that groundwater separation was insufficient for subsurface infiltration. Soil logs can be found in Appendix D of the Drainage Report.
>
> We have survey shots at the bottom of Mill Brook ranging from elevation 146.38 to 147.79 which is between 4-5.5 feet from the top of channel wall depending on location.
>
> I will get in touch with our field crew regarding the existing closed drainage system that runs through the center of the site to Mill Brook to see if they have additional invert elevations and what they observed within the catch basin

structures.

Regards,

Ryan Landers, E.I.T.
Project Engineer
MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: Wayne Chouinard <WChouinard@town.arlington.ma.us>
Sent: Monday, February 7, 2022 1:32 PM
To: Ryan Landers <rlanders@mckeng.com>; David Morgan <dmorgan@town.arlington.ma.us>
Cc: Bill Copithorne <wcopithorne@town.arlington.ma.us>
Subject: RE: NOI Filing - Colonial Village Drive

Hello Ryan & David,
I have begun reviewing the site plans provided but do not have access to the entire submittal, including a hydrological report? hydraulic analysis, test pit soil logs?

Also, if you have in additional survey information for the Mill Brook Channel and existing drainage features, I would be interested on the elevations of the bottom of the Mill Brook Channel as well as additional elevations for the drainage structures. Some manholes have rim elevations, but no inverts elevations and the catch basins do not indicate a sump bottom elevation or if there are hooded outlets present.

Is this information available?

Thank you,

Wayne

Wayne A. Chouinard, PE
Town Engineer
Arlington Public Works
51 Grove Street
Office: (781) 316-3320
E-mail: wchouinard@town.arlington.ma.us

> From: Ryan Landers <rlanders@mckeng.com>
> To: David Morgan <dmorgan@town.arlington.ma.us>, Wayne Chouinard <WChouinard@town.arlington.ma.us>
> Date: Fri, 4 Feb 2022 15:06:30 +0000
> Subject: RE: NOI Filing - Colonial Village Drive
>
> CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
>
> CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.
>
> Thank you David, I do not see the Site Plans included in the Google Drive link you provided so I have attached them here.

Wayne, if you need any additional information to help facilitate your review, please do not hesitate to ask.

Regards,

Ryan Landers, E.I.T.
Project Engineer
MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: David Morgan <dmorgan@town.arlington.ma.us>
Sent: Friday, February 4, 2022 9:24 AM
To: Ryan Landers <rlanders@mckeng.com>
Cc: Wayne Chouinard <WChouinard@town.arlington.ma.us>
Subject: Re: NOI Filing - Colonial Village Drive

Hi Ryan and Wayne,
Ryan, I am writing to connect you with Town Engineer Wayne Chouinard for review of the proposed work at Colonial Village Drive. Wayne, would you please review this proposal at your earliest convenience? The work includes resurfacing of the parking lot at Colonial Village condominiums and stormwater retention and treatment before discharging to Mill Brook. The condos are next door to Hurd Field. The Conservation Commission has held two hearings and would like your input in advance of the next meeting, please, by Wednesday of next week.
Site plans and other relevant documents can be found here.
Cheers,
David
David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012 | dmorgan@town.arlington.ma.us
Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.
On 2/3/2022 3:21 PM, Ryan Landers wrote:

> CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
>
> CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.
>
> Great, thanks David and see you tonight.
>
> Regards,
>
> Ryan Landers, E.I.T.
> Project Engineer
> MCKENZIE ENGINEERING GROUP
> Assinippi Office Park
> 150 Longwater Drive, Suite 101

Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: David Morgan <dmorgan@town.arlington.ma.us>
Sent: Thursday, February 3, 2022 2:40 PM
To: Ryan Landers <rlanders@mckeng.com>
Subject: Re: NOI Filing - Colonial Village Drive

Thanks for checking in, Ryan. We're good to go. No questions have been submitted to me as of this afternoon.
David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012 | dmorgan@town.arlington.ma.us
Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.
On 2/3/2022 11:46 AM, Ryan Landers wrote:

> CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
>
> CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.
>
> Hi David,
>
> Just checking in to make sure you received our hard copies and to see if we might expect any questions/concerns to arise during the meeting tonight.
>
> Thanks,
>
> Ryan Landers, E.I.T.
> Project Engineer
> MCKENZIE ENGINEERING GROUP
> Assinippi Office Park
> 150 Longwater Drive, Suite 101
> Norwell, MA 02061
> P: 781.792.3900
> F: 781.792.0333
>
> ---
>
> **From:** David Morgan <dmorgan@town.arlington.ma.us>
> **Sent:** Wednesday, January 26, 2022 3:48 PM
> **To:** Ryan Landers <rlanders@mckeng.com>
> **Cc:** Austin Chartier <AChartier@mckeng.com>
> **Subject:** Re: NOI Filing - Colonial Village Drive
>
> Hi again,
> I meant to mention that the printed copies should follow the same instructions as the NOI with stamped envelopes, etc.
> David Morgan | Environmental Planner + Conservation Agent | Department of Planning and Community Development | 781.316.3012 | dmorgan@town.arlington.ma.us
> *Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.*
> On 1/26/2022 10:26 AM, Ryan Landers wrote:
>
> > CAUTION: This email originated from outside your organization. Exercise

caution when opening attachments or clicking links, especially from unknown senders.

CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.

Hi David,

Please see resubmission documents for our February 3rd Conservation Hearing at the Dropbox link below:

https://www.dropbox.com/sh/eaqmq2tlcw5mcrm/AAB-Zx5wa2n29OjY84aXf-Ewa?dl=0

The attachments include our response letter addressing all comments from the January 20th Hearing, and a revised 'Notice of Intent' and 'Drainage Calculations and Stormwater Management Plan'. Please let me know if you will require hard copies of the attached materials.

Regards,

Ryan Landers, E.I.T.
Project Engineer
MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: Ryan Landers
Sent: Wednesday, December 22, 2021 12:58 PM
To: David Morgan <DMorgan@town.arlington.ma.us>
Cc: Austin Chartier <AChartier@mckeng.com>; RClapp@town.arlington.ma.us
Subject: RE: NOI Filing - Colonial Village Drive

Hi David,

Please find our Notice of Intent submission for Colonial Village Drive at the dropbox link below:

https://www.dropbox.com/sh/uungj5norn72e12/AAC_5gIhvMhk3VwOhEM41VADa?dl=0

Included in the link are the following submission documents:

1. Civil Plan Set
2. Filing Letter
3. NOI Filing Documents
4. NOI Report
5. Stormwater Report

Six copies of all documents will be delivered to the Town Hall tomorrow along with two filing fee checks, and 6 stamped envelopes to mail the NOI to Commission members.

Please let me know if there is anything else you need before tomorrow's filing deadline for the January 6 Conservation hearing.

Thanks,

Ryan Landers, E.I.T.
Project Engineer

MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

From: David Morgan <DMorgan@town.arlington.ma.us>
Sent: Wednesday, December 15, 2021 10:52 AM
To: Ryan Landers <rlanders@mckeng.com>
Subject: Re: NOI Filing - Colonial Village Drive

Hi Ryan,
I just got my hands on the dates the Commission approved for 2022, which I'm attaching here. Although it says draft, these were approved with no changes. The deadline for the January 6th meeting would be the 23rd of December. There will not be a meeting on December 30th.

To your question, I'll address those envelopes for you, so submitting them just the way you described is perfect.

Cheers,
David

David Morgan | Environmental Planner + Conservation Agent | 781.316.3012
Arlington values equity, diversity, and inclusion. We are committed to building a community where everyone is heard, respected, and protected.

> From: Ryan Landers <rlanders@mckeng.com>
> To: "DMorgan@town.arlington.ma.us" <DMorgan@town.arlington.ma.us>
> Cc: "RClapp@town.arlington.ma.us" <RClapp@town.arlington.ma.us>
> Date: Tue, 14 Dec 2021 15:57:16 +0000
> Subject: NOI Filing - Colonial Village Drive
>
> CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.
>
> CAUTION: This email originated from outside of the Town of Arlington's email system. Do not click links or open attachments unless you recognize the REAL sender (whose email address in the From: line in "< >" brackets) and you know the content is safe.

Hi David,

Looking to make sure we file our NOI at least two weeks prior to the next meeting date.

Is the next Conservation meeting Thursday, Dec. 30 or Thursday, Jan. 6? Also, the NOI filing instructions include 6 envelops with appropriate postage. Do these envelopes just need to be stamped and include our return address?

Thanks,

Ryan Landers, E.I.T.
Project Engineer



Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
P: 781.792.3900
F: 781.792.0333

Attachments:

221-155 C-3.pdf	736 KB
221-155 Stormwater Report - Revised 1-24-2022.pdf	15.5 MB

Notice of Intent: Hurd Field (Continuation)

Summary:
This public hearing will consider a Notice of Intent for renovations to Hurd Field located at 0 Massachusetts Avenue and 0 Lowell Street (off Drake Road). Work is proposed to be conducted within the Riverfront Area to Mill Brook, Bordering Land Subject to Flooding (FEMA Zones AE and X, Floodway), the 100-foot Buffer Zone to Bordering Vegetated Wetlands and the Adjacent Upland Resource Areas. Renovation includes regrading and reorienting the athletic fields, upgrading field lighting, and constructing a pedestrian loop path, irrigation system, and other new amenities.

Notice of Intent: Spy Pond Playground (Continuation)

Summary:
This public hearing will consider a Notice of Intent for improvements to Spy Pond Playground and the ramp to Spy Pond at North Beach, both located at 0 Pond Lane. Work is proposed to be conducted within the Adjacent Upland Resource Area and 100-foot buffer zone to Inland Bank and Bordering Vegetated Wetland. The improvements include replacing play equipment, replacing safety surfacing, replacing perimeter fence, and the addition of a new playground entrance. The scope also includes replacing the pathway material used at North Beach ramp.

ATTACHMENTS:

	Type	File Name	Description
🗋	Reference Material	Spy_Pond_Supplemental_Materials_from_KZLA.pdf	Spy Pond Supplemental Materials from KZLA
🗋	Reference Material	Spy_Pond_Surfacing_Summary_by_KZLA.pdf	Spy Pond Surfacing Summary by KZLA
🗋	Reference Material	Spy_Pond_NHESP_2022.pdf	Spy Pond Natural Heritage & Endangered Species Program Letter
🗋	Reference Material	TURI_Report_on_Playground_Surfacing.pdf	TURI Report on Playground Surfacing

SPY POND PLAYGROUND &
NORTH BEACH RAMP - SUPPLEMENTAL MATERIALS

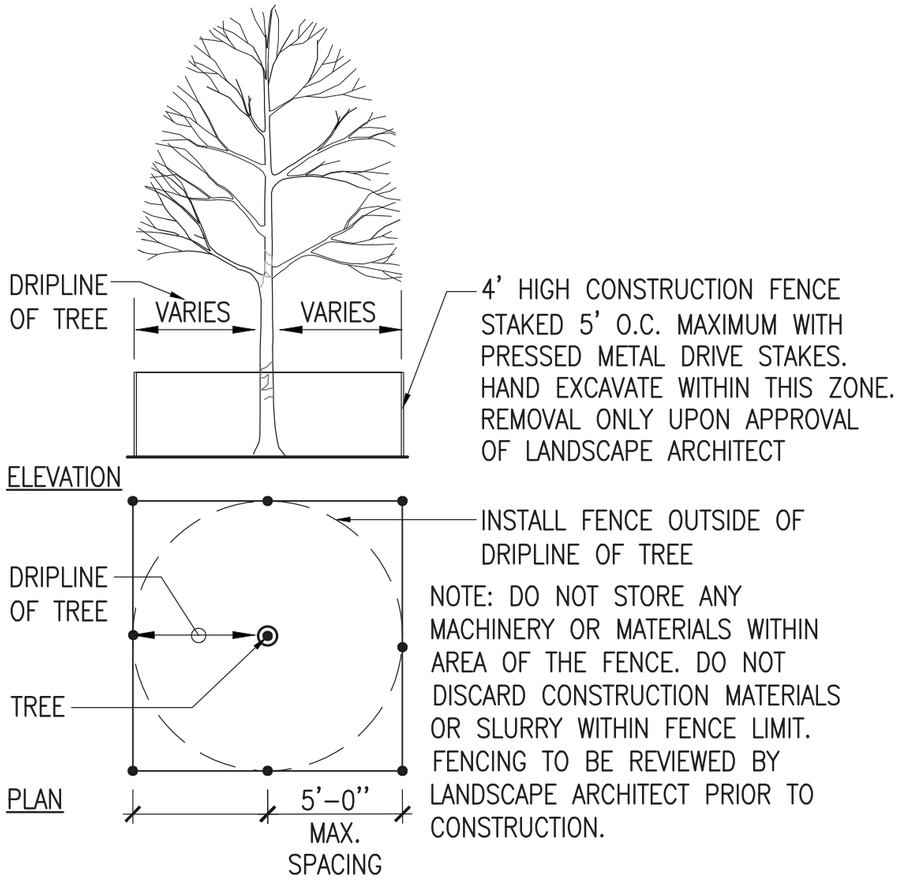
CONSERVATION COMMISSION

February 17,2022

March 3, 2022

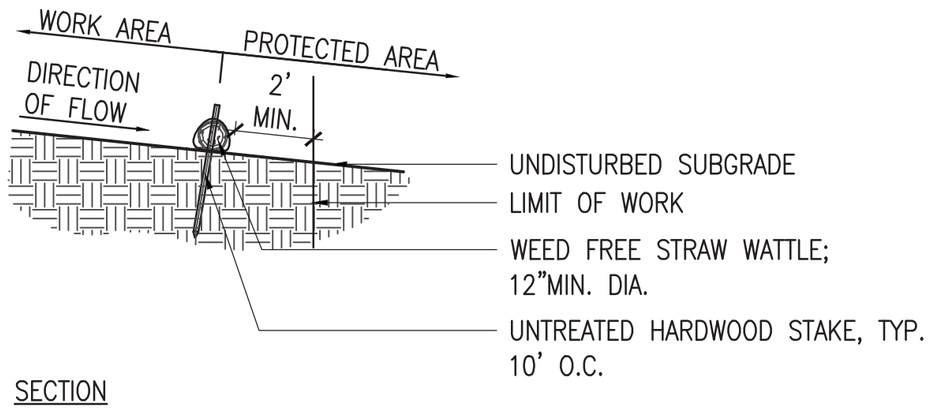


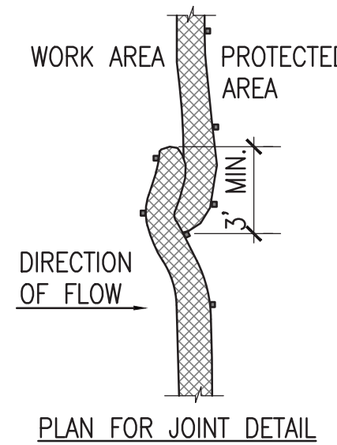
kzla



1 TREE PROTECTION FENCE

SCALE: N.T.S.



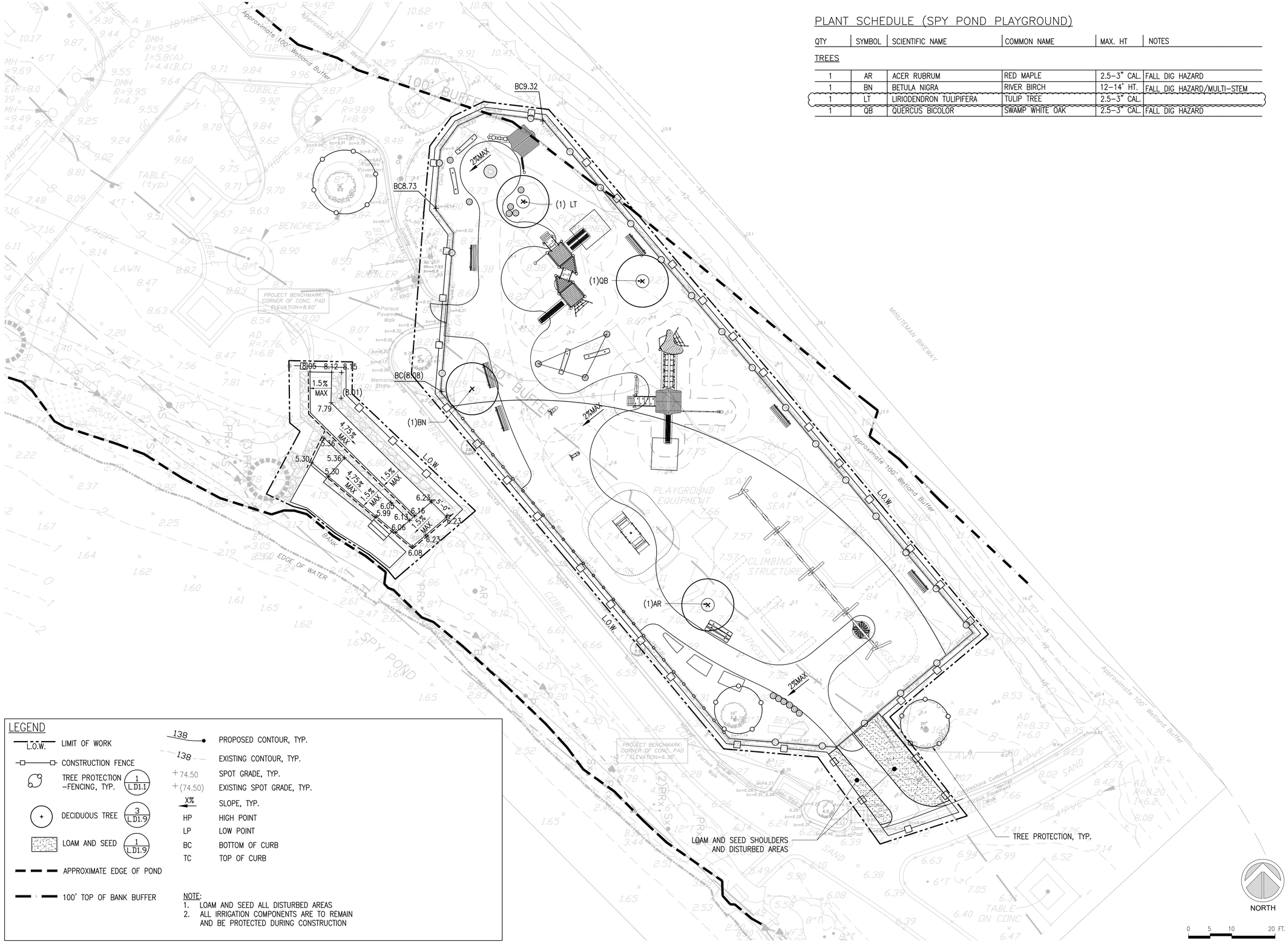


2 EROSION CONTROL - FILTER SOCK

SCALE: N.T.S.

PLANT SCHEDULE (SPY POND PLAYGROUND)

QTY	SYMBOL	SCIENTIFIC NAME	COMMON NAME	MAX. HT	NOTES
TREES					
1	AR	ACER RUBRUM	RED MAPLE	2.5–3" CAL.	FALL DIG HAZARD
1	BN	BETULA NIGRA	RIVER BIRCH	12–14' HT.	FALL DIG HAZARD/MULTI-STEM
1	LT	LIRIODENDRON TULIPIFERA	TULIP TREE	2.5–3" CAL.	
1	QB	QUERCUS BICOLOR	SWAMP WHITE OAK	2.5–3" CAL.	FALL DIG HAZARD



LEGEND

- L.O.W. — LIMIT OF WORK
- CONSTRUCTION FENCE
- TREE PROTECTION –FENCING, TYP. (1 / LD1.1)
- DECIDUOUS TREE (3 / LD1.9)
- LOAM AND SEED (1 / LD1.9)
- APPROXIMATE EDGE OF POND
- 100' TOP OF BANK BUFFER

138	PROPOSED CONTOUR, TYP.
138	EXISTING CONTOUR, TYP.
+74.50	SPOT GRADE, TYP.
+(74.50)	EXISTING SPOT GRADE, TYP.
X%	SLOPE, TYP.
HP	HIGH POINT
LP	LOW POINT
BC	BOTTOM OF CURB
TC	TOP OF CURB

NOTE:
1. LOAM AND SEED ALL DISTURBED AREAS
2. ALL IRRIGATION COMPONENTS ARE TO REMAIN AND BE PROTECTED DURING CONSTRUCTION

SPY POND PLAYGROUND + PARMENTER SCHOOL PLAYGROUND

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202 617 451-1018 Tel
Boston, MA 02108 www.kylezick.com

SPY POND PLAYGROUND

Job Number:
Project: ARLINGTON PLAYGROUNDS
Drawn By: RB Checked By: KZ
Date: FEBRUARY 1, 2022
Scale:
Drawing Title:

GRADING AND PLANTING PLAN

L3.1

kzla

February 23, 2022

David Morgan
Town of Arlington
730 Mass Ave. Annex
Arlington, MA 02476

RE: Spy Pond & North Beach Ramp NOI Application

Dear David:

As per the Commission's request for additional information, attached is a summary of our findings for the surfacing materials for the Spy Pond Playground. We have also reviewed the TURI (Toxic Use Reduction Institute) Report #2018-003 titled "Playground Surfacing", which was provided to us at the Commission's recommendation.

During the Conservation Commission on February 17th, the presented playground plan included pervious surfacing for the entirety of the playground. The majority of the surfacing is engineered wood fiber surfacing (75.4% of total area) and the remainder is proposed to be poured-in-place rubber surfacing (24.6%) for the accessible route.

While engineered wood fiber surfacing is considered to meet ADA requirements, it requires routine maintenance and raking to ensure it remains compacted and maintains a depth that meets all fall height requirements. Our plan focuses on using engineered wood fiber around play equipment, but not for the route leading from the entrance to the play equipment which would be considered a very high traffic area.

The intent of using poured-in-place rubber is to create a stable, accessible route that connects entrances to all play equipment and site features. By doing so, we are creating a fully inclusive playground that is accessible to all varying levels of mobility. The poured-in-place rubber meets all fall height requirements, is slip resistant, and provides a firm surface that would be much easier to navigate when using a wheelchair or other mobility device compared to wood fiber surfacing.

In addition to the accessible route, another added benefit of using poured-in-place surfacing is the extra play value. We are proposing patterns in the surfacing colors that are a colorful interpretation of the history of Spy Pond. The rectangular shapes are intended to represent the ice harvesting history of the site in a subtle way that will be fun for kids to play around and interact with.

A concern that came up during the meeting was heat. While poured-in-place rubber can get hot from sun exposure, we are proposing the accessible route along the pond facing side of the playground which receives the most shade from existing trees. This shade should help cool the surface of the rubber. We are also proposing user lighter colors that will not get as hot.

kzla

Another concern was the materials used in the rubber surfacing. The urethane binder used in playground poured-in-place rubber is very similar to the polyurethane binder used in the existing porous paving pathways around Spy Pond. The primary differences are color and viscosity. The color of the porous pavement currently on site is amber and the polyurethane used is more rigid so that the pavement surface remains firm. The urethane used for the poured-in-place rubber is less rigid to maintain the bounce in the surface and is clear to maintain the coloring.

The poured-in-place rubber we are specifying consists of a 100% post-consumer recycled SBR (Styrene-butadiene) rubber and polyurethane base, and a top surface (color) of 100% post-industrial EPDM (Ethylene Propylene Diene Monomer) rubber and polyurethane. The warranty of the poured-in-place surface is 10-years, which will ensure it continues to meet or exceed fall height requirements.

We believe the poured-in-place rubber is the best material to use for an accessible route in a playground. The surface will require less maintenance and provide the greatest ease of maneuvering for someone with a mobility device. Both poured-in-place rubber and engineered wood fiber surfaces are pervious, allowing water to infiltrate and not change existing drainage patterns. We have limited the use of the poured-in-place rubber to only the minimal area recommended for providing a safe, long-lasting route to the play equipment.

Sincerely,
Rob Barella
RLA, Associate

Kyle Zick Landscape Architecture, Inc.

36 Bromfield Street, Suite 202, Boston, MA 02108
t: 617-451-1018 e: kzick@kylezick.com www.kylezick.com

MASSWILDLIFE

DIVISION OF
FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

February 28, 2022

Arlington Conservation Commission
730 Massachusetts Ave
Arlington MA 02174

Joseph Connelly
Town of Arlington Parks & Recreation Commission
422 Summer Street
Arlington MA 02476

RE:	Project Location:	0 Pond Lane
	Project Description:	Improvements to Spy Pond Playground and North Beach Ramp
	Town:	ARLINGTON
	DEP Wetlands File No.:	091-0339
	NHESP File No.:	**09-26949**

Dear Commissioners & Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries and Wildlife (the "Division") has received and reviewed revised plans (dated 2/1/22) for the subject project.

The Division finds that the revised plans do not represent a material change in the plans (dated 7/18/18, revised 8/30/18) that were previously submitted for review pursuant to 310 CMR 10.59 of the Massachusetts Wetlands Protection Act (WPA) Regulations and 321 CMR 10.18 of the Massachusetts Endangered Species Act (MESA) Regulations. Therefore, the revised plans do not change our original determination (Division letter dated September 24, 2018) that this project **will not adversely affect** the actual Resource Area Habitat of state-protected rare wildlife species and **will must be conditioned to avoid a prohibited Take** of state-listed rare species, and that original determination stands. Issuance of an Order of Conditions approving the project as currently designed is consistent with the Interests of the WPA strictly related to state-listed rare wildlife species. A copy of any final Order of Conditions shall be mailed or hand delivered to the Division simultaneous with sending to the applicant as required pursuant to 310 CMR 10.05(6)(e)).

All work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. Any project or activity not included in the revised plans and located within *Priority Habitat* may require an additional filing with the Division for review pursuant to the MESA, if not otherwise exempt. If no physical work is commenced on the proposed project within five years from the date of issuance of our original determination or there is a change to the project, updated information and/or plans must be sent to the Division for review prior to any work**.**

Please contact Melany Cheeseman, Endangered Species Review Assistant, at (508) 389-6357 with any questions or comments.

Sincerely,

Everose Schlüter, Ph.D.
Assistant Director

cc: Kyle Zick, Kyle Zick Landscape Architecture, Inc.
MA DEP, Northeast Region

Playground Surfacing

Choosing Safer Materials for Children's Health and the Environment



TURI Report #2018-003
December 2018

TURI
TOXICS USE REDUCTION INSTITUTE
UMASS LOWELL

Acknowledgments

This report was prepared by Lindsey Pollard and Rachel Massey from the Toxics Use Reduction Institute, with input from Molly Jacobs and Polly Hoppin from the Lowell Center for Sustainable Production; Elizabeth Harriman, Joy Onasch, and Heather Tenney from the Toxics Use Reduction Institute; Rebekah Thomson from the Field Fund; Kara Rubio from Women for a Healthy Environment; and Katherine Butler from Recycling Works Massachusetts. Work on this report was supported by a grant from The Heinz Endowments.

Cover photo: A school playground in Westford, Massachusetts, with engineered wood fiber surfacing.

Playground Surfacing:
Choosing Safer Materials for Children's Health and the Environment

Introduction

Playground surfacing helps to protect children as they walk, run, jump, fall, and interact with their surroundings in the course of play. A range of materials are sold as playground surfacing. Some of these materials contain chemicals of concern for human health and the environment. In response to requests from communities, TURI has compiled information on a range of playground surfacing options, with a particular focus on chemicals that may be found in these materials, and how they may affect playground users.

Vulnerable populations, such as pregnant women and children, may be especially sensitive to hazards posed by chemicals found in synthetic playground materials. Children are uniquely vulnerable to the effects of toxic chemicals because their organ systems are developing rapidly and their detoxification mechanisms are immature. Children are also more likely to have hand-to-mouth exposure to environmental contaminants than adults.[1] For these reasons, it is particularly important to make careful choices about children's exposures.

Based on TURI's research on chemical contents of playground surfacing materials, wood products—especially engineered wood fiber (EWF) tested and verified to be free of chromated copper arsenate (CCA)—are safer choices for health and the environment. Synthetic products pose potential chemical hazards that can be avoided by using alternative materials.

Playground Surfacing Materials: Overview

Playground surfacing materials are installed underneath play equipment to cushion falls. They can be made from natural or synthetic materials including sand, pea gravel, wood, and rubber. These materials come in a variety of forms; for example, wood options include wood chips or bark mulch, EWF, or bonded EWF (EWF bound with adhesive). Rubber materials are used in products such as shredded waste tires (also referred to as rubber mulch), rubber tiles and pour-in-place (PIP) surfacing. The U.S. Consumer Product Safety Commission (CPSC) states that grass, dirt, concrete, asphalt, or other hard surfaces are not considered protective surfacing options for playgrounds.[2] Protective fall materials are typically installed on top of a prepared sub-base of gravel, soil, geotextile, or an impervious concrete slab.

Surfacing materials fall into two broad categories: loose-fill surfacing materials and unitary surfacing materials. Table 1 provides an overview of these material categories.

- **Loose-fill surfacing** material consists of loose particles such as sand, pea gravel, EWF, or rubber mulch/shredded tires.[2]
- **Unitary surfacing** materials consist of rubber tiles, rubber mats, or other materials (e.g., rubber granule, plastic, or EWF) held in place with a binder. These materials may be poured in place and cured at the playground site to form a unitary surface.[2] Unitary surfacing installation designs vary between companies, but typically include a base layer beneath a "decorative" top layer of bonded materials. The base layer is usually composed of either

gravel, concrete or asphalt.[3, 4] For PIP and artificial grass installation, a cushioning layer made of either loose or bonded shredded waste tire is usually installed between the base and top layer.

Table 1. Playground surfacing materials: Loose-fill and unitary options

Category	Material
Loose-fill	Engineered wood fibers (EWF)*
	Wood chips or bark mulch
	Sand
	Pea gravel
	Rubber mulch
Unitary	Bonded EWF*
	Pour-in-place (PIP) rubber surfacing*
	Rubber tiles and mats*
	Artificial grass*

* Americans with Disabilities Act (ADA) compliant

Health and Environmental Hazards

Chemicals of concern

Some materials used in playground surfacing contain toxic chemicals, creating potential hazards for manufacturers, installers, playground users, and the environment. This section provides a brief overview of chemical hazards that may be relevant when choosing a playground surfacing material.

Synthetic surfacing materials. A variety of rubbers or plastics can be used in playground surfacing. Loose-fill rubber products are generally made with shredded waste tires. Unitary rubber, including tiles and PIP surfacing, is made with granulated particles processed from materials such as waste tires, thermoplastic elastomer (TPE), or ethylene propylene diene terpolymer rubber (EPDM), and held together with chemical binders and adhesives. An additional material sometimes used is thermoplastic vulcanizate (TPV). In TPV, a vulcanized product such as EPDM is combined or coated with a thermoplastic, such as polypropylene. Chemicals of concern are found in both loose-fill recycled tire rubber and unitary products.[5, 6] Pigments added to tire materials may also be a source of concern.

Tires are primarily composed of styrene butadiene rubber (SBR). They also contain a wide variety of intentionally added chemicals, such as stabilizers, fillers, and vulcanization (curing) agents. Additional substances can adhere to tires during use.[5] Some of these ingredients are chemicals known to be hazardous to human health, such as polyaromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), and heavy metals, such as lead.
A number of PAHs have been identified as known or suspected human carcinogens by the International Agency for Research on Cancer.[7] Many of these PAHs (e.g. benz(a)anthracene, benzo(a)pyrene, benzo(k)fluoranthene, benzo(b)fluoranthene, indeno(1,2,3-c,d)pyrene, chrysene, and dibenz(a,h)anthracene) have been found in waste tire rubber, in the air around the rubber, or in leachate from the rubber according to an EPA literature review.[8] Acute VOC exposure can cause eye, nose, and throat irritation, headaches,

and nausea; longer-term exposure can cause damage to internal organs.[9]

Several VOCs that are known or suspected carcinogens, such as benzene and hexane, have been measured in recycled tire materials.[8] Metals found in recycled tires, such as lead, pose concerns as well. For example, even low levels of lead in a child's blood can result in behavior and learning problems, slowed growth, and anemia.[10] Concerns associated with some other chemicals found in tires (e.g., phthalates) include endocrine disruption.[8]

TPE and EPDM are often marketed as alternatives to recycled tires in unitary surfacing. These materials may potentially pose a lower level of concern than recycled tires, but they can contain hazardous chemicals as well. In addition, both TPE and EPDM can include a variety of polymers and additives. For this reason, it is difficult or impossible to make broad statements about the safety of a given product unless one has access to more detailed information.

TURI reviewed a safety data sheet for a brand of artificial turf infill material made with TPE. The TPE was composed of styrene block copolymer, paraffin oil, calcium carbonate (chalk), carbon black, polyethylene, and unspecified stabilizers and antioxidants.[11] TPE used in playgrounds could have a similar composition, or could contain other chemicals not noted here. In general, EPDM rubber can contain PAHs, VOCs and a range of additives including carbon black, oils, and minerals.[12]

Recycled waste tire material in playgrounds: A study by the Consumer Product Safety Commission (CPSC)

The "Federal Research Action Plan: Crumb Rubber" is a multi-agency study including the CPSC, Environmental Protection Agency and the Centers for Disease Control, created to investigate the potential health and environmental effects of chemicals found in recreational surfacing made from recycled tires. As one element of this study, the CPSC used a combination of focus groups, field observations, and a survey of parents and child-care providers to collect information on children's behavior when playing on loose-fill and unitary surfacing made from recycled tires. The study shows that children frequently pick up or pick at, mouth, chew, or fall on surfaces.[a] The CPSC found that the study findings raise exposure concerns that deserve further investigation. The CPSC offers the following precautions for limiting exposure to materials made from recycled tires.

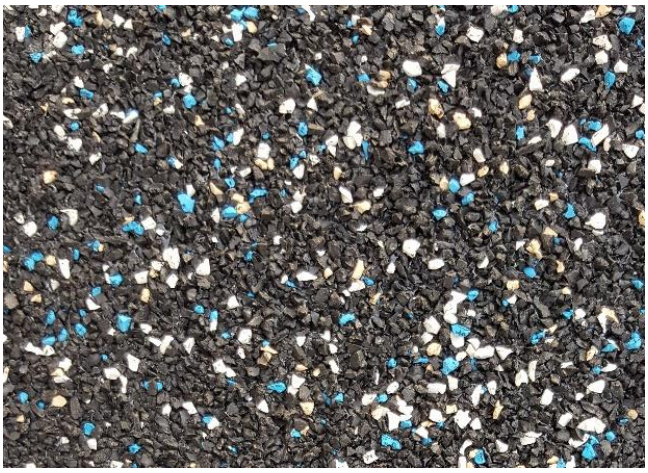
1. "Avoid mouth contact with playground surfacing materials, including mouthing, chewing, or swallowing playground rubber. This may pose a choking hazard, regardless of chemical exposure.
2. Avoid eating food or drinking beverages while directly on playground surfaces, and wash hands before handling food.
3. Limit the time at a playground on extremely hot days.
4. Clean hands and other areas of exposed skin after visiting the playground, and consider changing clothes if evidence of tire materials (e.g., black marks or dust) is visible on fabrics.
5. Clean any toys that were used on a playground after the visit."[b]

[a] Harsanyi, S. 2018. Summary of Playground Surfacing Focus Groups. United States Consumer Product Safety Commission. Retrieved from https://www.cpsc.gov/s3fs-public/Playground_Surfacing_Focus_Group_Report_2018.pdf?

[b] U.S. Consumer Product Safety Commission. 2018. Federal research action plan: crumb rubber. Retrieved from Crumb Rubber Information Center: https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center

Another synthetic surfacing option on the market is artificial grass, generally composed of plastic grass fibers and nylon or plastic backing atop a polyurethane cushioning layer, fabric liner, and/or shredded waste tires.[13] Many brands use waste tire granules or sand as an infill to hold the artificial grass in place. The chemical constituents of the waste tire materials pose health and environmental concerns. Ingredients found in the fibers and/or cushioning may also be of concern.[14]

Ingredients used in synthetic playground materials vary between brands. It is important for playground decision-makers to be aware of what chemical constituents are present in material options under consideration by asking vendors or manufacturers directly for detailed safety data sheets, test data, and catalogs.



PIP consists of EPDM, TPE, or waste tire granules, held in place with adhesives.

Binders and adhesives. Rubber, artificial grass, and bonded wood unitary surfacing materials contain binder and adhesive chemicals. The binder ingredients used to make and bind unitary rubber tiles, pour-in-place (PIP), and bonded EWF vary depending on brand. Urethanes are typically used to bind rubber and/ or TPE granules together, and to glue rubber tiles or artificial grass pieces together, according to manufacturer safety data sheets reviewed by TURI. Urethanes are made using chemicals in the diisocyanate family, such as methylene diphenyl diisocyanate (MDI). In general, diisocyanates are asthmagens and dermal and lung sensitizers.[15, 16] Hazardous chemicals found in binders mainly pose an occupational inhalation hazard during manufacturing and installation. However, if the cured binder contains any unreacted monomer, this could potentially create exposures for playground users as well.[16]



EWF colored green and bonded together with chemical adhesive.

Sand and pea gravel. Playground sand may contain trace amounts of crystalline silica (quartz) dust. Airborne crystalline silica dust exposure is known to cause pulmonary diseases, including cancer, in an occupational setting.[17] There are several brands of sand on the market that advertise to be free of crystalline silica dust. According to manufacturer safety data sheets. Pea gravel is primarily made from quartz, which does not pose chemical concerns when in stable, solid form.

Wood. Loose-fill wood chips, bark mulch and EWF are all made from raw wood. Wood chips are made from ground fresh trees, and bark mulch is a byproduct of the industrial paper and lumber industries. EWF looks similar to wood chips and is manufactured similarly to bark mulch, but is designed specifically for use as playground safety surface material.[2] Wood products can only be labeled EWF if they meet the specific particle size,

consistency, purity, and drainage standards described in American Society for Testing and Materials (ASTM) 2075: *Standard specification for engineered wood fiber*.[2] EWF is also tested for levels of soluble hazardous elements such as lead, chromium, cadmium, and arsenic.[18]

The CPSC states in the *Public Playground Safety Handbook* that treated wood must not be used in playground surfacing, as it may contain CCA.[2] CCA is an insecticide and wood preservative composed of arsenic, chromium, and copper.[19] The CPSC also states that wood playground surfacing manufacturers must provide test data on material toxicity to ensure that no CCA-treated wood has been mixed in with playground materials. The CPSC suggests avoiding use of any wooden playground surfacing products where the CCA content is unknown. Therefore, it is important for decision-makers to request and review test data before installing.

With regard to chemicals only, the least hazardous choices for playground handlers and users are: loose-fill wood products tested for absence of CCA; pea gravel; and sand tested for absence of crystalline silica dust. A summary of health and environmental hazard information for all materials is presented in Table 4.



A playground in Lowell, MA, with wood chip surfacing.

Environmental concerns

The primary environmental concern associated with playground surfacing is the potential for synthetic surfacing to produce contaminated runoff water. Numerous studies show that metals such as zinc, and toxic chemicals such as PAHs and phthalates, can leach from shredded rubber into natural environments.[8] This means that the leached hazardous substances can be carried into natural systems by stormwater or irrigation runoff. Even small amounts of these toxicants can create negative effects on aquatic life.[5] Any of the synthetic material options can also cause general pollution issues since the synthetic pieces can migrate outside of intended play areas.



Loose synthetic PIP granules can migrate into the environment. These particles were found in an area adjacent to a playground located in Somerville, MA.

Unitary surfacing installation may also lead to loss of water-permeable surface area. Overall, playground surfacing installation designs and material porosity vary between companies, allowing for different drainage capabilities. If the sub-base is an impervious material, such as concrete, or the fall protection material allows for only minimal water filtration to the sub-base, the playground area may disrupt rainwater infiltration. Loss of stormwater filtration through soil leads to lowered water quality and a higher quantity of stormwater runoff into natural water systems, like rivers and wetlands.[20]



As unitary synthetic surfacing begins to age, it may deteriorate and expose the loose-fill cushioning layer underneath. This layer is typically made with shredded waste tires.

TURI consulted Recycle Works Massachusetts on disposal options available for different surfacing materials. End of life disposal options are limited for synthetic materials used on playgrounds. Rubber mulch can only be recycled at specialized facilities for a fee. In general, unitary synthetic products are not recyclable because of their adhesives, and they may not be reused because the materials are usually well worn by the end of their life. Synthetic materials that cannot be recycled or reused are disposed in a landfill for a fee, and do not biodegrade. In contrast, wood materials can be composted onsite, or through a company. Many composting facilities in Massachusetts will pick up or receive these materials for no charge. Used sand and pea gravel may be sifted and reused on other playgrounds, or in different applications, such as landscaping.

Heat hazards

Rubber has a higher potential to cause contact burns as it can heat up and transfer heat quickly to skin.[21] Thermal burns on playgrounds can occasionally result in serious injuries.[22] CPSC reported 29 thermal burns associated with playgrounds (mostly second- and third-degree burns) between 2001 and 2008. Of these, 14 involved playground surfacing.[23]

There are few published studies focused directly on playground surfacing temperatures and burns. However, one study in a hot climate found that unshaded rubber surfacing reached temperatures at or above the CPSC temperature threshold for thermal burn injury.[21]

Dangerously hot temperatures on playgrounds, created by heat absorbing materials, can also create a microscale “heat island."[21] A parents’ group in Massachusetts provided TURI with temperature data. For example, on a day when the air temperature measured 75° F, the parents’ group documented a temperature of 171° F on a PIP playground surface.[24] Research led by the Center for Sports Surface Research at the University of Pennsylvania indicates that all artificial turf reaches higher temperatures than natural grass.[25]



A parents' group in West Tisbury, MA, recorded a PIP surface temperature of 171.1° F with an air temperature of 75° F.

Other potential hazards

Loose-fill materials, in general, have the potential to hide foreign objects, and are more likely to be used by children as "play material" (i.e., throwing or putting in mouth). Wood and pea gravel surfacing have the potential to grow mold, though mold growth can be avoided by ensuring adequate drainage on and around the play area. Drainage planning is recommended for all loose-fill products in order to minimize decomposition, mold growth, and particle migration.[2]

Performance Criteria

Critical fall height ratings

The CPSC requires that playground surfacing materials be tested for critical height, or "an approximation of the fall height below which a life-threatening head injury would not be expected to occur."[2] Because playground materials may degrade or be displaced over time, the CPSC suggests testing the impact performance of playground materials annually. Communities can ask their chosen playground installation company about annual field tests for impact performance. Communities may also choose to install play equipment that requires lower fall height protection.

Loose-fill surfaces have standard fill depths that offer protection for fall injury prevention. Table 2 shows the minimum required depth of each compressed loose-fill material, and the maximum fall height at which injuries will be prevented, according to CPSC. It is important to note that EWF, wood chips, and rubber mulch all offer the same amount of fall protection. Loose-fill material compresses by at least 25% due to use and weathering, which must be taken into account during installation and when planning long-term maintenance.[2] Loose-fill material depths will also decrease over time due to displacement of materials outside of the play area. Critical height depths must be maintained over time by "topping-off" materials in order to preserve performance.

Unitary surface materials have varied quality and shock-absorption properties, and therefore do not have standard fill depths for fall heights.[2] Manufacturers must supply critical fall height test data for all playground surfacing, including specifications for unitary rubber tiles or pour-in-place materials.[2]

Table 2. Minimum surfacing depths for compressed loose-fill materials

Compressed surfacing depth (inches)	Loose-fill material	Maximum protected fall height (feet)
6	Rubber mulch	10
9	Wood chips, EWF	10
9	Bark mulch (non-CCA)	7
9	Pea gravel	5
9	Sand	4

Source: U.S. Consumer Product Safety Commission, 2015

Accessibility

Playground accessibility for persons with disabilities is an important aspect of playground planning. In order for a surfacing material to be labeled as compliant with regulations within the Americans with Disabilities Act (ADA), it must fulfill wheelchair accessibility specifications described in ASTM 1951: *Standard specification for determination of accessibility of surface systems under and around playground equipment*.[2]

EWF and unitary surfacing options are designed to be ADA compliant.[2] The wood pieces in EWF are sized to "knit" together when compacted, causing the pieces to remain in place, creating an even, accessible surface. EWF must be raked to maintain evenness, especially under swings and slides, in order to maintain performance. Provided that they are in good condition, unitary rubber and bonded wood are inherently stable due to the chemical adhesives holding the base cushioning material in place.

Costs

We contacted several suppliers and installers of playground surfacing materials to provide some general, preliminary information on costs associated with material discussed in this fact sheet. Table 3 summarizes these findings. This information is provided for general reference only; costs are likely to be variable, and this overview does not necessarily cover all the factors that may be relevant for an individual community.

Table 3. Cost estimates for initial installation, regular maintenance, and disposal of playground surfacing materials for a 2500 square-foot area[a]

Material	Initial cost	Maintenance activities/cost	Disposal[b]
EWF, woodchips, bark mulch	• Raw materials: $2,600 • Materials and installation with drainage: $7,500	• Raking back into play area, top-off every 3-5 years • Cost of raw materials for 10% top-off: $300	Compost, many companies offer free drop-off or pick up
Sand	• Raw materials: $3,000	• Raking and leveling, top-off every 2-3 years. • Cost of raw materials for 10% top-off: $300	Reused (e.g., surfacing in community areas) or repurposed at a facility
Pea gravel	• Raw materials: $5,000	• Raking back into play area, top-off every 1-2 years • Cost of raw materials for 10% top-off: $500	Reused (e.g., other playgrounds or landscaping)
Artificial grass	• Materials, installation of sub-base, and surfacing materials: $38,000	• Sweeping, blowing or vacuuming, inspection for damage • Patching heavily worn areas	Landfill, recycling or reuse may be possible
Unitary rubber (PIP)	• Materials, excavation, installation of sub-base and PIP materials: $50,000	• Sweeping, blowing or vacuuming, inspection for damage • Patching cracks and heavily worn areas	Landfill drop-off for a fee
Rubber mulch	• Raw materials: $8,000 • Materials and installation: $15,000	• Raking back into play area, top-off every 1-2 years • Cost of raw materials for 10% top-off: $800	Recycled at specialized facilities for a fee

[a] Fill volumes were estimated using minimum fill depths in Table 2. Cost figures were provided by several suppliers in October 2018. Costs are likely to vary by time, location, brand, and functional requirements.

[b] For all options except artificial grass, disposal information was provided by personal correspondence with Recycle Works Massachusetts. TURI did not obtain detailed information on options for disposing of artificial grass.

Questions to Consider when Choosing a Playground Surfacing Material

In researching this topic, TURI found variability in chemical contents, physical characteristics, and/or installation techniques between brands of unitary surfacing products. Below are a number of questions that decision-makers may want to ask manufacturers and vendors in order to gain a more complete understanding of topics such as material contents, installation design, and disposal options.

- What are the chemical constituents of all layers of material?
- What tests have been conducted to check for chemicals in the material?
- What method of disposal is used for the materials when it is time to replace them?
- Are the materials permeable? What are the drainage options for the surfacing?
- What critical fall height protection can be achieved with the material?
- Can the installation company test fall protection performance annually?
- What is the surface temperature of the material located in the sun with air temperature above 80^{o} F?
- What is the lifespan of the materials and cost of maintenance?

Summary

From an environmental and health standpoint, wood products, especially EWF tested and verified free of CCA, are safer choices for playground surfacing material based on chemical content. EWF also offers high fall protection and ADA accessibility when correct material depth and evenness are maintained. Synthetic products, made with or without recycled tires, pose potential chemical hazards that can be avoided by using alternative materials. Table 4 summarizes the overall characteristics for each material reviewed in this document. Playground planners are encouraged to request and carefully review data on contents and toxicity. Planners are also encouraged to read installation instructions from manufacturers on their specific materials in order to make the safest and most informed choices.

Table 4. Summary of health, environmental, and performance criteria

Materials are listed in order of least concern (green) to greatest concern (orange) to playground users based on chemical hazard criteria only. TURI has attempted to identify the key concerns for each material.

Health & Environmental Hazard Criteria					Performance Criteria	
Material (color coding based on chemical hazards)	**Possible chemicals of concern**	**Health effects associated with chemicals of concern**	**Other human health concerns[a]**	**Environmental concerns**	**Fall protection**	**ADA compliant**
EWF, wood chips, bark mulch Tested for absence of CCA	—[e]	—[e]	Mold growth possible[b]	—[e]	High	Yes (EWF only)
Sand Tested for absence of crystalline silica dust	—[e]	—[e]	—[e]	—[e]	Low	No
Pea gravel	—[e]	—[e]	—[e]	—[e]	Low	No
EWF, wood chips, bark mulch Not tested for absence of CCA	Traces of CCA possible.[2]	Arsenic exposure can increase risk of certain types of cancer.[19]	Mold growth possible[b]	Possible runoff contamination	High	Yes (EWF only)
Sand Not tested for absence of crystalline silica dust	Traces of crystalline silica dust.[26]	Inhalation of crystalline silica dust can cause respiratory disease, including lung cancer.[17]	—[e]	—[e]	Low	No
Bonded EWF	Binding substances can contain hazardous chemicals (such as MDI) before they have been cured.[27]	Respiratory issues, skin sensitization, development of asthma and possible carcinogenicity. (Primarily an occupational exposure concern.)[16]	—[e]	Possibility of impervious surface[d]	Depends on installation design	Yes
Artificial grass	PAHs, VOCs, heavy metals, phthalates, and others found in some infills; binding substances can contain hazardous chemicals (such as MDI) before they have been cured; grass blades can pose concerns as well.[5, 6, 8, 11, 12,14]	Carcinogenicity, endocrine disruption, respiratory irritation or skin irritation.[7, 9, 10]	Heat hazard	Possible runoff contamination, migration of synthetic materials offsite	Depends on installation design	Yes
Rubber tiles, PIP	PAHs, VOCs, heavy metals, phthalates; binding substances can contain hazardous chemicals (such as MDI) before they have been cured.[5, 6, 8, 11, 12]	Carcinogenicity, respiratory irritation or skin irritation. (Substances in binder primarily present occupational exposure concerns.)[7, 9, 10]	Heat hazard	Possible runoff contamination, possibility of impervious surface, migration of synthetic materials offsite[d]	Depends on installation design	Yes
Loose-fill rubber	PAHs, VOCs, heavy metals, phthalates, and others.[c, 5, 8]	Carcinogenicity, endocrine disruption, respiratory irritation or skin irritation. (CPSC notes that children frequently pick up or pick at, mouth, chew, or fall on loose-fill surfacing.)[7, 9, 10, 28]	Heat hazard	Possible runoff contamination, migration of synthetic materials offsite	High	No

a. Information on abrasion hazards associated with playground surfacing was not included in this report.
b. Mold growth is unlikely provided that drainage is adequate.
c. Exposure is likely to be greater with loose-fill rubber as children may handle and play with the material.
d. Some installation designs include the addition of an impervious concrete sub-base.
e. TURI did not identify any priority concerns for hazards covered in this report.

Glossary of Acronyms

ADA	Americans with Disabilities Act
ASTM	American Society for Testing and Materials
CCA	Chromated copper arsenate
CPSC	The U.S. Consumer Product Safety Comission
EPA	The U.S. Environmental Protection Agency
EPDM	Ethylene propylene diene terpolymer
EWF	Engineered wood fiber
MDI	Methylene diphenyl diisocyanate
PAH	Polyaromatic hydrocarbon
PIP	Pour-in-place
SRB	Styrene butadiene rubber
TPE	Thermoplastic elastomer
TPV	Thermoplastic vulcanizate
VOC	Volatile organic compound

References

1. Landrigan, P. 1998. Environmental Hazards for Children in USA. *International Journal of Occupational Medicine and Environmental Health*, *11*(2), 189–94.
2. U.S Consumer Product Safety Commission. 2015. *Public Playground Safety Handbook*. Bethesda, MD.
3. Surface America. (n.d.). Recreational and Athletic Surfacing. Retrieved November 14, 2018, from https://www.surfaceamerica.com/product/playbound-poured-in-place/
4. Game Time. 2018. Poured in place rubber. Retrieved November 14, 2018, from https://www.gametime.com/playground-surfacing/poured-in-place-rubber
5. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, infill made from recycled tires*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_Recycled_Tires
6. Llompart, M., Sanchez-Prado, L., Pablo Lamas, J., Garcia-Jares, C., Roca, E., & Dagnac, T. 2013. Hazardous organic chemicals in rubber recycled tire playgrounds and pavers. *Chemosphere*, *90*(2), 423–431.
7. International Agency for Research on Cancer. 2018. Agents classified by the IARC monographs, Volumes 1-123. Retrieved from https://monographs.iarc.fr/agents-classified-by-the-iarc/
8. U.S. Environmental Protection Agency. 2016. *Federal Research Action Plan on Recycled Tire Crumb Used on Playing Fields and Playgrounds, Status Report*. Retrieved from https://www.epa.gov/sites/production/files/2016-12/documents/federal_research_action_plan_on_recycled_tire_crumb_used_on_playing_fields_and_playgrounds_status_report.pdf
9. U.S. Environmental Protection Agency. 2017. Volatile organic compounds' impact on indoor air quality. Retrieved November 11, 2018, from https://www.epa.gov/indoor-air-quality-iaq/volatile-organic-compounds-impact-indoor-air-quality
10. U.S. Environmental Protection Agency. 2018. Learn about lead. Retrieved from https://www.epa.gov/lead/learn-about-lead
11. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, chemicals in alternative synthetic infills: thermoplastics elastomer (TPE)*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_TPE
12. Toxics Use Reduction Institute. 2017. *Sports turf alternatives assessment: preliminary results, chemicals in alternative sythetic infills: EPDM*. Retrieved from https://www.turi.org/Our_Work/Community/Artificial_Turf/Infills_EPDM
13. Zeager Bros, Inc. 2009. *Recreation surface catalog*. Retrieved from https://www.zeager.com/content/uploads/2018/09/Zeager-Recreation-Surfaces-Brochure-2019.pdf

14. Pavilonis, B. T., Weisel, C. P., Buckley, B., & Lioy, P. J. 2014. Bioaccessibility and risk of exposure to metals and SVOCs in artificial turf field fill materials and fibers. *Risk analysis : an official publication of the Society for Risk Analysis*, *34*(1), 44–55.
15. Toxics Use Reduction Institute. 1999. *Massachusetts Chemical Fact Sheet: 4,4-Methylene Diphenyl Isocyanate*. Retrieved from https://www.turi.org/content/download/182/1439/file/Fact Sheet Methylene Diphenyl Isocyanate 2000.pdf
16. U.S. Environmental Protection Agency. 2011. *Methylene diphenyl diisocyanate (MDI) and related compounds action plan [RIN 2070-ZA15]*. Retrieved from https://www.epa.gov/sites/production/files/2015-09/documents/mdi.pdf
17. National Institute for Occupational Safety and Health. 2002. *Health effects of occupational exposure to respirable crystalline silica*.
18. American Society for Testing and Materials. 2015. *Standard specification for engineered wood fiber for use as a playground safety surface under and around playground equipment, active standard ASTM F2075*.
19. U.S. Environmental Protection Agency. (n.d.). Chromated Arsenicals (CCA). *November 2016*. Retrieved from https://www.epa.gov/ingredients-used-pesticide-products/chromated-arsenicals-cca
20. Brabec, E., Shulte, S., & Richards, P. L. 2002. Impervious surfaces and water quality: a review of current literature and its implications for watershed planning. *Journal of Planning Literature*, *16*(4), 499–514.
21. Vanos, J. K., Middel, A., McKercher, G. R., Kuras, E. R., & Ruddell, B. L. 2016. Hot playgrounds and children's health: A multiscale analysis of surface temperatures in Arizona, USA. *Landscape and Urban Planning*, *146*, 29–42.
22. Ford, G., Moriarty, A., Riches, D., & Walker, S. 2011. *Playground Equipment: Classification & Burn Analysis*. Retrieved from https://web.wpi.edu/Pubs/E-project/Available/E-project-122111-202154/unrestricted/WPI_Final_Report_IQP-CPSC.pdf
23. O'Brien, C. W. 2009. *Injuies and investigated deaths associated with playground equipment, 2001-2008*.
24. Data provided by Rebekah Thomson, personal communication. (n.d.).
25. Center for Sports Surface Research. 2012. *Synthetic turf heat evaluation: progress report*. Pennsylvania State University, University Park, PA.
26. Quikrete. 2011. Playsand Safety Data Sheet. Atlanta, GA. Retrieved from https://www.quikrete.com/pdfs/msds-b4-playsand.pdf
27. Advanced Polymer Technology. 2017. *Woodcarpet binder safety data sheet*. Harmony, PA.
28. U.S Consumer Product Safety Commission. 2018. Federal research action plan: crumb rubber. Retrieved from https://www.cpsc.gov/Safety-Education/Safety-Education-Centers/Crumb-Rubber-Safety-Information-Center

Playground Surfacing

Choosing Safer Materials for Children's Health and the Environment

The Toxics Use Reduction Institute is a multi-disciplinary research, education, and policy center established by the Massachusetts Toxics Use Reduction Act of 1989. The Institute sponsors and conducts research, organizes education and training programs, and provides technical support to help Massachusetts companies and communities reduce the use of toxic chemicals.

Toxics Use Reduction Institute
University of Massachusetts Lowell
126 John Street, Suite 14
Lowell, Massachusetts 01852
(978) 934-3275
www.turi.org